# The Mining Journal

London, April 7, 1961

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**Vol. 256** **No. 6555**

***Established 1835***

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***Published each Friday by***
**THE MINING JOURNAL LTD.**

*Directors*
E. Baliol Scott (*Chairman*)
U. Baliol Scott (*Managing*)
G. A. Baliol Scott
R. A. Ellefsen

**15 WILSON STREET, LONDON, E.C.2**

*Telegraphic* Tutwork London
*Telephone* MONarch 2567 (3 lines)

**Annual Subscription £3 15s. Single copy ninepence**

## A New Deal in World Finance

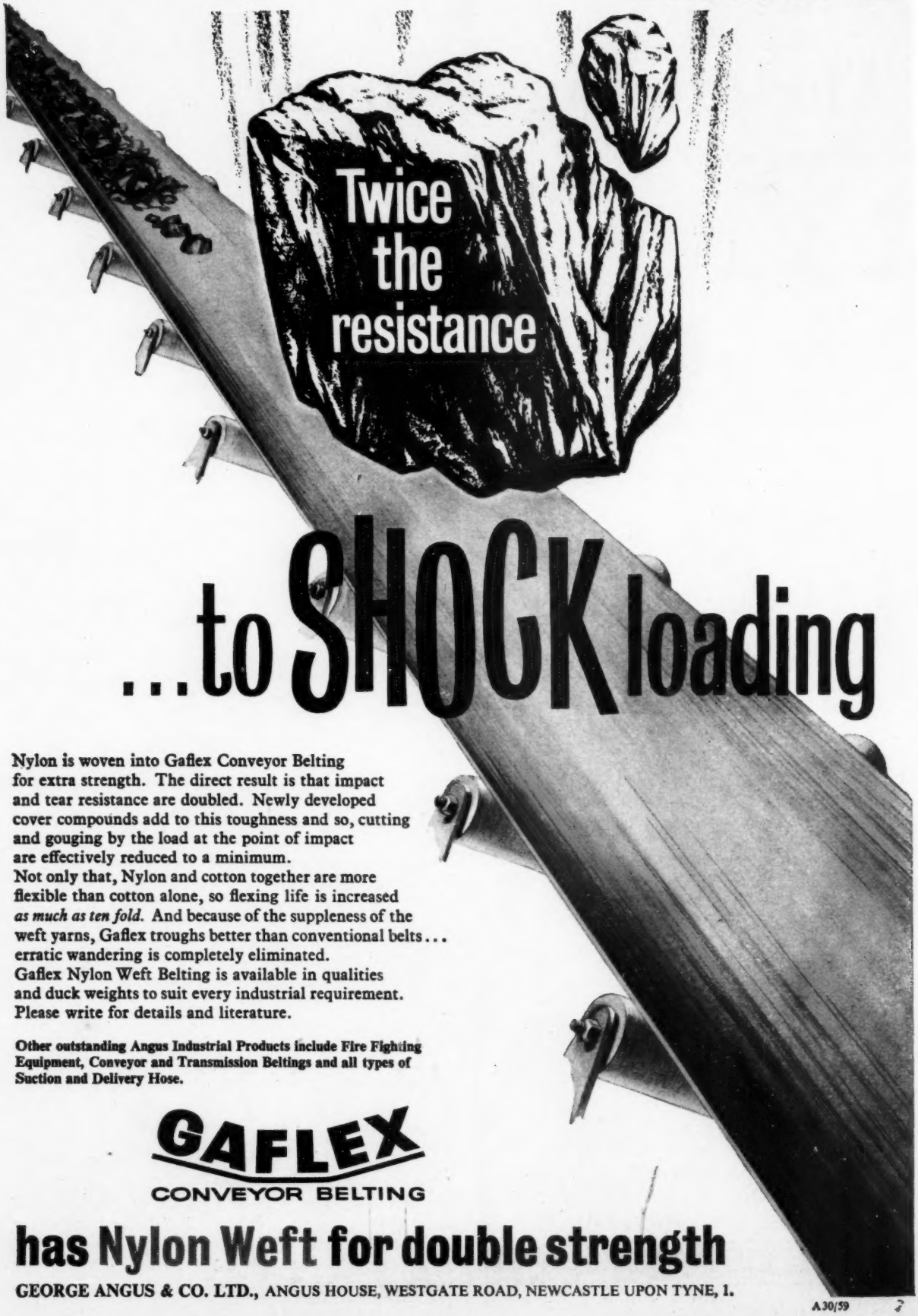
NOW that some of the major uncertainties that led to the flare-up in the London gold market last October have disappeared, the international monetary scene can be viewed in a calmer atmosphere. Speculative elements are no longer paramount, the new American administration is firmly in the saddle and attention now focuses on the real financial issue at stake: how to increase international liquidity so as to promote a higher rate of economic growth in the industrialized West and in the less developed countries.

Once President Kennedy had made it abundantly clear in his message to Congress on February 6 that America's monetary and economic problems were to be resolved without any increase in the dollar price of gold, even the small discount against the dollar disappeared in the London market, and on February 23 gold was "fixed" at 250s. 8d. or at the dollar equivalent of $35.08, its lowest level for 13 months. Since then the price has been fairly steady just above the official parity of $35.

Meanwhile, steps to give more stability to international finance and to give more rein to the I.M.F. were taken on February 15, when sterling and nine other currencies including the Deutsch mark, the French franc and the Italian lira became formally convertible. This meant their dispensing with the protection under Article 14 of the I.M.F. Agreement (which provides arrangements for countries to impose and maintain foreign exchange controls) and coming under Article 8 which means, in effect, that currencies are guaranteed to be kept convertible for non-residents and free of discrimination. Furthermore, it means that sterling and the other nine currencies will be acceptable for repayments to the fund which, of course, not only lessens pressure on the dollar but will strengthen the I.M.F.'s hand in helping to tackle the world liquidity problem.

The strain which has been imposed on the dollar has been obvious for all to see in recent years and now the flight from sterling which took place in the early part of March (and sterling has nothing like the dollar's defence in depth) has given us all fervent reason to hope that, if indeed we are to dispense with the rise in the gold price, Washington and the I.M.F. will get on with the new deal in international monetary management.

So far all the indications are that salvation through the I.M.F. is to be pursued by the new American administration to the limit. There are so many strong currencies now and the dollar is not the only one as Mr. Per Jacobsson, managing director of the I.M.F., said in a recent speech. Funds could be shifted from one hard currency to another without fear. Plans for making the Fund more useful in helping to solve members' balance of payments problems were reported on April 4 to have been already drafted, and they were thought likely to be presented at the annual meeting of the I.M.F. and the World Bank next September. Since it appears, however, that these plans have been drawn up within the framework of the existing articles of agreement there is nothing concrete to suggest, as yet, that the Fund will be converted into a world central bank, with or without the creation of an international currency unit to take its place alongside gold.

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Whatever are to be the accepted international units of account, it is at least to be hoped that in the aggregate they will constitute a sufficiently large reserve at the I.M.F.'s disposal for that institution to be able to tolerate short-term balance of payments deficits in member countries of a magnitude which will not result in the periodic curbs on economic expansion as in the past. For example, it has been the quick succession of monetary and fiscal changes of tempo and direction which have bedevilled Britain's economy in the last decade.

If the sterling area and the rest of the western world is, in effect, to be asked to surrender custody of its monetary and fiscal conscience to the I.M.F. we must all start with a clear idea of what the Fund's underlying policy is to be and how far this policy is likely to operate in the best interests of the member countries.

It is doubtless admirable that the central banks should continue to be gentlemanly to one another, but public confidence in the wisdom of what they are at is not helped by their continuing to play their cards so close to the chest. Europe and North America do not have between them a monopoly of world trade and, if the I.M.F. is to become an acceptable supra-national monetary authority, there is nothing to be gained by secrecy.

The I.M.F. is still a long way from becoming a world-wide, as distinct from a western, institution and whatever may be the currencies with which it elects to supplement its gold reserves, these currencies must for practical purposes remain as good as gold to serve their purpose. This may take some doing when we consider the distribution of last year's world supplies of new gold.

Samuel Montagu and Co., in their recent annual gold review, estimate world output excluding the U.S.S.R. in 1960 at 34,000,000 oz. to which they add 6,000,000 oz. as net Russian sales during the year. Out of this total of 40,000,000 oz. of new gold, Samuel Montagu estimates that 16,000,000 oz. was absorbed by central banks and similar official institutions including I.M.F. and that a further 7,000,000 oz. was absorbed by industry and the arts, leaving some 17,000,000 oz. to be added to the already very large gold hoardings in France, Latin America and the Middle and Far East which all continue to show a distressing preference for this traditionally acceptible security!

Incidentally, it is interesting to note that Samuel Montagu estimates that the purchase of gold by U.S. interests in the last quarter of 1960 probably did not exceed 2,800,000 oz. Although considerably less than generally supposed, this report confirms that the bulk of these purchases were at second-hand, which tends to underline the doubts which have been expressed as to how effective will be President Eisenhower's order banning private American gold holdings abroad. Certainly there is no reason why this order should result in the repatriation of any American-owned gold nor indeed in its conversion into dollars in the absence of any restrictions on the private American holding of foreign currencies.

The more one looks back on events of the past winter, the more unnecessary it all seems. Things have come to a pretty pass when a mere $100,000,000 worth of American "funk" money can lead to a ban on private American gold holdings abroad, when perhaps half that amount applied in September and October by the U.S. Treasury to steadying the London gold market would have been so much more effective and so much less embarrassing.

Finally, let us be clear that no amount of tinkering with the mechanics of international settlement will in the long term absolve individual countries from keeping their economies in order. Raising the gold price or shoring up the I.M.F.'s reserves will enable individual countries to run balance of payments deficits for longer than they otherwise would have done, and to that extent eliminating the need for short-term deflationary measures. In the long term, however, countries have still got to pay their way and cut their living standards and habits of work according to their cloth.

This was just the problem that confronted Germany at the end of the war and with which she has so successfully grappled; it is the one to which we in Britain have still to find the political answer and it is the one with which the United States is now squarely faced. Sterling and the dollar are likely to remain the principal elements in the I.M.F.'s currency reserves and a failure in either country effectively to arrest inflation and revitalize the growth of productivity could still bring about a devaluation of these currencies in terms of gold, if not this year then at any rate within a period which still justifies the retention in most portfolios of a proportion of gold shares as a hedge against this contingency.

## COPPER EXTRACTION

Copper producers are continually endeavouring to reduce production costs in order to meet the competition from other metals, in particular aluminium. To this end mining methods have been improved, automation of the flotation plant is receiving considerable attention and in smelting great efforts are being made to improve fuel efficiencies and increase throughput per unit.

All these efforts to date have been confined to improving standard processes and to lowering costs by the use of bigger and better plants. However, in the the technical press much has recently been written about a novel refining fabricating plant which claims spectacular lowering of both capital and operating costs and it is encouraging to see a copper producer breaking fresh ground.

The process is based on the work done by Professor Forward carried out over several years on hydrometallurgical processes at high pressures and a paper was presented by Professor Forward and Dr. Halpern (both of University of British Columbia, Vancouver) on this subject to the Institution of Mining and Metallurgy London in 1957. A commercial application of the principles involved is in operation by the Sherritt Gordon Mines Ltd. at Fort Saskatchewan whereby nickel is successfully extracted, but the plant to be built in the Philippines is the first, commercial application to the extraction of copper. (see *The Mining Journal*, February 10, 1961).

This new process, however, will not outmode the conventional smelting processes overnight nor will it follow that any new producer will immediately embrace this breakaway from pyrometallurgical operations. Many aspects will spring to mind which will need careful consideration. Amongst these are the disposal of large quantities of ammonium sulphate, (6 tons ammonium sulphate; 1 ton copper) and the cost of maintaining a plant where corrosion problems can be severe.

It does seem, given certain special conditions such as ready sale of fertilizers, cheap natural gas for ammonia and hydrogen preparation, cheap power and specific copper production rates, that this process can be economical. This economical aspect can be enhanced by the use of powder metallurgical techniques to produce fabricated copper but this again requires special conditions to find a ready market for these products. Nevertheless while the process warrants careful consideration by present producers and possible producers, it is felt that it will not, at this stage, oust the conventional smelting and refining.

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The future of this plant will be watched closely by those interested in new developments in copper extraction and as experience is gained and details of capital and operating costs made available, a more precise appreciation will be possible.

## AUSTRALIA'S LONG-TERM URANIUM PLANS

The newly discovered lode at Rum Jungle is stated to be greater than those which have been worked out and of comparable grade. The original orebodies were worked by open cut and modern earth moving equipment and the ore stockpiled. Remaining stockpiled ore will supply the treatment plant well beyond the expiry date of the existing contract. The new orebody will also be worked by open cut. Decision as to the future was deferred until tenders had been considered for contract open cut mining of the Rum Jungle South Creek lode. A tender has now been accepted and the Commonwealth Government has decided to continue the enterprise, which is to be operated by Territory Enterprises Pty. Ltd.

The ore from the new orebody can be treated at the present treatment plant. Treatment policy has not yet been considered and the new ore supply may not be drawn upon until exhaustion of broken ore reserves at the beginning of 1963. It is officially stated that the market for uranium is likely to be uncertain for a period of years after expiry of the contract, but Rum Jungle will produce uranium for sale at competitive prices either for Australian requirements in the long term, or for world markets.

Australia is proving to be one of the few countries with substantial deposits of uranium, and it is necessary, therefore, to conserve and develop the uranium resources in the Rum Jungle area. The South Australian Government will endeavour to keep the Radium Hill mine and field, and the chemical treatment plant at Port Pirie, going when the contract for uranium oxide expires at the end of this year. It has invested nearly £A7,000,000 in the Radium Hill venture, which has sold uranium oxide to the value of £15,000,000 approximately, has covered all operating charges and provided a surplus of £4,800,000 representing 70 per cent of the capital expenditure.

The unfavourable uranium outlook has caused the Commonwealth Government to cease payment for the discovery of uranium deposits, but nevertheless, aerial geophysical prospecting is being continued by the Commonwealth Government in several parts of the country.

## MAGNETITE FOR W. CANADIAN STEEL

Large new ore deposits have been discovered at Choiceland, Western Canada, which will eventually meet the needs of a new $15,000,000 steel plant producing hot-rolled carbon steel plate, sheet, strip, structural steel and skelp. Claimed to be the first of its kind in Western Canada, the new plant has recently been put into production at Regina, Saskatchewan, by the Interprovincial Steel and Pipe Corporation Ltd. The corporation will also supply welded steel pipe from its pipe division—Prairie Pipe Manufacturing Co., now in its fourth year of production.

While, initially, stockpile steel scrap will be the most important raw material, the new Regina plant will draw on iron ore from Montana in the U.S., which, together with ferro-manganese, ferro-silicate and burnt lime, as well as small ingots of alloy metal, has also been stockpiled. The initial furnace capacity of 100,000 ingot tons per annum is expected to be increased to 150,000 ingot tons per annum when a third furnace now under construction, has been installed.

In order to keep pace with market growth, steps have been taken to ensure the development of integration still further by mineral exploration on the iron ore properties owned by the company at Choiceland, some 280 rail miles north-east of Regina. What is claimed to be a vast deposit of exceptionally pure magnetite ore, grading 30-33 per cent Fe content, has been proved and, when required, this ore body will be developed to the production stage to supply the mill at Regina. This direct reduction of iron ore, in addition to the use of scrap, will permit the present and planned steel facilities to step up production to meet future market demands.

## OIL DUMPING THREATENS COLLIERIES

The chairman of the Australian Coal Association has said that the dumping of residual oil from the refineries in markets held by coal, at prices with which coal cannot compete, could result in closing of collieries. The Joint Coal Board has also stated that the oil industry is cutting its prices with increasing severity. This problem has caused major power users to change from coal to residual oil.

It is proposed by the coal and oil industries to convene a conference to discuss the loss of coal markets and to approach the Commonwealth Government with a view to ending the dumping. The position is serious, for the number of oil refineries has increased, and more refineries are planned. The coal industry has fought a hard and successful battle to re-establish itself, in the face of competition from oil, and several million pounds have been spent in mechanization and modernization of collieries. This policy, together with the high state of efficiency reached, has raised the industry to a top rank amongst coal producing countries and has built up the export trade from a negligible position to one approaching 2,000,000 tons per year.

Sales within the country have also increased substantially and the industry is now prosperous. Recent figures on output per man shift in the fourth quarter of 1960 show that in comparison with the same quarter of 1959, output per man-shift in underground mines increased by 12 per cent to 5.6 tons.

In Queensland, output per man-shift in 1960 was 17.51 tons at the face and 5.27 tons overall in fully mechanized mines (13.80 per cent of all collieries). In part-mechanized mines, comprising 21.41 per cent of all mines, production at the face was 9.68 tons per man-shift, and 2.86 tons overall. In non-mechanized mines, constituting 57.26 per cent of all collieries, output per man-shift at the face was 6.92 tons and 2.86 tons overall. Continuous miners were introduced in June 1960. Over the period 1950 to 1959, output per man-shift at the face rose from 6.13 tons to 7.54 tons and overall from 2.96 to 3.41 tons. Queensland has followed New South Wales in the construction of coal washeries and now has 18 plants in operation.

Export of open cut coal from Queensland to Japan is increasing in importance. The Kianga-Moura coal fields are to be developed as a joint Australian-Japanese venture, in which the Japanese smelting interests are expected to invest £A8,000,000. The project will include construction of a railway of 110 miles from Kianga to the port of Gladstone, together with port improvements to cope with a demand for 3,000,000 tons of coal per year.

# The Changing Market for Metals

THE mineral industry presents a rather strange picture to the world today—a picture built up on a series of ill-fitting components in which there seems to be little relationship between the present depressed state of the industry and the great anticipated demand. We are currently passing through a period in which minerals are in surplus supply. Many in the mining industry assume that this is a temporary situation, and a variety of steps are being taken to minimize its effect on the industry.

Thus we see large producing companies voluntarily reducing output so that the market will not be flooded and the price structure shattered. We see strikes in mineral producing areas, with the consequent hardship on miners, looked upon by the industry with relief rather than dismay, and the settlement of strikes looked upon with misgiving rather than rejoicing. Even the political unrest in some mineral producing areas, which threatens not only the mineral production of the area but also the peace of the world, does not seem to produce the degree of concern in mining circles that one might expect. We are passing through a period of depressed markets and the mining industry reacts to such situations by tightening up, holding prices as well as possible, and waiting for better times which are sure to come.

They have every reason to believe that things will improve, for not only have we gone through cycles of shortage and surplus before, but every source of prediction which ventures into the area of long-range forecasting sees a continuously increasing demand for mineral raw materials, and predicts the approach of a new period of mineral shortages.

The analysts foresee a significant increase in the North American demand for copper, lead, zinc, and aluminium, and a deficit in domestic supply in all except aluminium. The picture for other parts of the world is similar. Three levels of increase are seen—a *per capita* increase in consumption in industrial countries, a general increase in population, and a movement towards higher consumption in under-developed countries. The combined effect of these three factors is translated into an increasing market for minerals expressed in an upward trending demand curve which optimistic producers interpret as an upward trending demand curve for individual minerals.

### How Real is the Growth in Demand?

From the point of view of many mineral producing companies the present situation is no cause for alarm, for it is not the first time that the industry has passed through cycles which can be explained in terms of short-term trends. When we move into a phase of over-supply, as at present, the large integrated producers generally manage to hold enough of the market to weather the storm, often with some help and concessions from the government, and look to making up their lost ground during the next phase when demand exceeds supply and the laws of the market force prices up.*

They rest secure in the knowledge that they produce a material which is essential to industry, and which has a natural market which will not be denied them.

Yet in recent years there has been some questioning of this belief and the thought has been expressed that perhaps this segment of the industry is fooling itself. Is the future a period of mineral shortage because of increased demand or because of decreased supply? Are the periods of fluctuation not at least partly due to changes in the nature of the mineral market rather than to cyclical irregularities in a continuing market? Do we in fact have any very clear concept of the nature of the market for minerals?

If we look at the recent past we will see that the market for minerals has not been behaving according to the rules, at least as the producers read them. Over recent years living standards have been rising, population has been increasing, and under-developed nations have been moving towards greater consumption. All these factors have led to an increase in the world market for minerals, but since we are still in a period of extreme over-capacity it would seem that the market has not increased at the rate that was expected.

Perhaps the greatest imbalance has been in the American market, where mineral consumption has not followed the general trend which, in spite of periodic recessions, has been upward. In the case of the base metals the *per capita* consumption, which one expects to rise with that of other goods, has in most cases decreased significantly. (The *M.J.* for January 20 notes that the U.S. copper consumption fell from 18.8 pounds *per capita* in 1952 to 15.8 pounds *per capita* in 1957, and this trend still continues). It should be noted that all metal consumption has not declined, for aluminium has steadily increased.

Some may find comfort in the evidence that the European market is behaving in a more normal way and that indeed there has been a continuing growth in the demand for base metals in the area. Once again, though, there is some question as to the nature of this market. Is *per capita* use in Europe increasing (statistics indicate that it is) or is a significant part of the growing market for minerals in Europe a reflection of expansion into export markets for finished goods? Perhaps more important, is the market for minerals growing as rapidly as that for other raw materials, and has there been any analysis of the nature of this growth and of the use trends that it indicates?

In spite of continuing market growth in Europe there is one guide which should cause some worry to the mineral industry, for in the past there has been some validity to noting trends in the United States markets and projecting them onto European charts as delayed trends. Thus there is some logic to arguing that the present downward trend in mineral consumption in the United States will soon extend to the rest of the industrial world, and that it indicates a real shift in the market for minerals rather than a cyclical variation.

It is relevant to note that on a comparison of consumption in Europe and the U.S.A. of lead, zinc, copper and aluminium, the last is the only one of these four metals which shows a considerable variation between the European and the American markets and, moreover, aluminium is the only metal for which the American market has continued to increase. Europe has shared in this increase but on a much lower level of consumption—aluminium has not yet made anything like the relative impact on the European market that it has in the United States.

Many in the mineral industry feel that the growing use of aluminium is in markets for which other metals were formerly used, and perhaps believe that this substitution

*It should be noted that even as the industry attempts to keep prices from falling too low during periods of over-supply they also make efforts to keep prices from rising too high during periods of shortage.

has been called to an earlier halt in Europe due to better marketing practices of those handling other metals. It seems likely, though, that most substitution of one metal for another took place some years ago, and that the growth in aluminium indicates expansion in markets which have already been captured, and the filling of new markets which have been created by the marketing research facilities of the companies which produce aluminium. Many of these markets which aluminium is supplying in the United States do not yet exist as markets for metals in Europe and the rest of the world.

**Readers will recall a series of articles published in these columns a year ago entitled "A Mineral Resources Policy for Britain". We now publish a further article by the same author, in which he examines the whole problem of minerals availability from the standpoint of the consumer and suggests that in many branches of the mining industry the marketing function has been sadly neglected. Mr. McDivitt is a member of the staff of the Department of Mineral Economics at Pennsylvania State University**

### Metals only a Part of the Raw Materials Market

The picture for metals over the next years then must remain clouded in spite of the forecasts of increasing demand. To a considerable extent these clouds may be due to foggy thinking within the industry, and it may be possible to dispell some of them so that the industry can make its full contribution to the future. There is no simple and obvious solution to the problems which face the mineral industry, but it would seem that the pattern of tightening up and holding prices during times of oversupply and selling at relatively inflated prices during times of shortage is not the best way to endear the industry to consumers. Certainly one of the less attractive aspects of mineral raw materials is price instability, but most consumers have had little choice.

Today the choice is increasing. One can say that there is a market for raw materials for industry and that this is a growing and continuing market due to the factors that have been mentioned. One cannot translate this directly into the statement that there is a growing market for copper or lead or zinc or aluminium which will follow the same pattern. The market is for raw materials, and we are finding that it is the customer who selects his raw materials, and that he selects on the basis of utility rather than tradition, although tradition is not yet completely dead in many markets.

The mineral industry supplies copper or lead or zinc: the consumer buys raw materials which will be copper or lead or zinc if these commodities best fill his needs at the time. As the mineral producers and marketers are coming to realize, there is a difference between these two concepts, and there is something to be said for considering their product as an industrial raw material rather than as a specific metal.

For a very long time minerals have had an inside track, in many markets to the point that mineral suppliers have come to think of these markets as being traditionally theirs—the markets for copper or lead or zinc rather than the market for a raw material which performs certain functions. But the customer who purchases the material uses it at an intermediate level in the manufacture of some other product, and so a raw material cannot be marketed as a distinct product; its ultimate success depends on its appeal to this intermediate customer who is making an economic product for re-sale, and who buys his raw materials from the raw materials market rather than from the metal market.

Thus there is little validity to the assumption that when general production increases and the traditional market for metals increases, the real market for metals will increase in direct relation. This very limited concept of the market which sees metals as being produced not for the breadth of possible demand but rather for a few traditional uses, leaves the industry very vulnerable to any changes in the attitude of consumers who, for example, look upon copper not as a metal but as a raw material.

### Factors Unfavourable to Metals

In fact, of course, metals have so much to commend them that, in selecting raw materials, they must always come in for the closest scrutiny. In very many cases they have superior physical qualities, but physical quality is by no means the only factor—we know of many markets in which minerals would be physically superior to the raw materials in use. Price, however, is also an important factor, as is price stability and reliability of supply, and here minerals may well lose out. To a potential customer the cycle of mineral production is not assuring.

A period of short supply develops for some reason, for example the Korean War. This may force customers to try substitutes which in many cases turn out to be adequate both technologically and economically. Mining companies rush to develop new sources of supply to overcome the shortage, but even when rushed this takes a number of years. A semblance of balance may be restored but a true balance is hard to find, and we move into a state of surplus as at present, aggravated by the belated appearance of stocks from the newly developed sources.

According to economic theory the excess supply should force prices down, but through a series of artificial (but justifiable since demand is relatively inelastic) measures the industry absorbs or muffles the excess capacity in an attempt to maintain prices. Consumers who may have shifted away from metals during the period of shortage hesitate to go back to metals partly because equipment and schedules are not completely interchangeable but also partly because they have been through such cycles before and feel that a switch back to metals through increasing metal demand, would be a factor in setting off another cycle of shortage, increased prices and confusion.

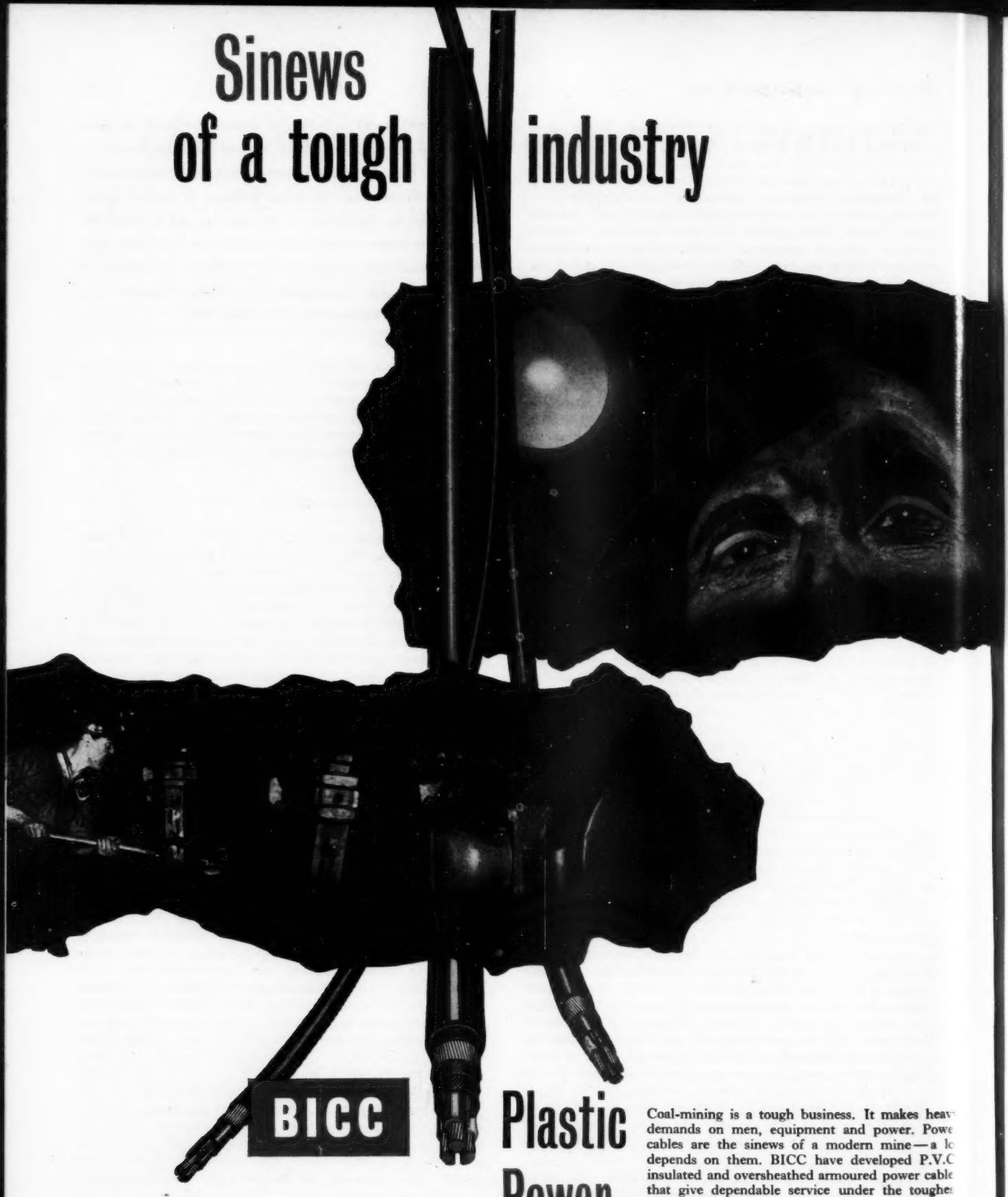
They may have learned that mineral supplies are not as reliable as many substitutes. Miners tend to strike for higher wages during periods of critical supply, adding one more factor of uncertainty, and incidentally harming the miners' future through forcing some users of their product to switch to other materials. And in addition to all this, the consumer sees the sword of long-range statistical prediction hanging over the mineral industry, for it is said that by 1975 or 1980 the demand for minerals will have increased to such a point that shortage is almost inevitable. Although a lot can happen before the forecast year there is a natural tendency to write out of one's plans materials which are expected to be in short supply in the future.

*(Continued on page 381)*

*By*

***JAMES F. McDIVITT***

# Sinews of a tough industry



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On this point it would be interesting to surmize that many statistical predictions defeat themselves through indicating trends which would be valid if they were not publicized, but which invalidate themselves through allowing the public to evaluate anticipated trends and to change their pattern so that they as individuals or companies will not be affected by what appear to be unfavourable features in the prediction.

**A Need for the Marketing Approach**

The mineral industry would seem to be in a trap, to some extent of its own making, and will require some rather vigorous activity to find its way out of it or even to survive successfully within. Some parallel problems and questions have been considered by Theodor Levitt, formerly an economic consultant to the oil industry and now working on marketing at the Harvard Business School.

In an article titled "Marketing Myopia" which appeared in the Harvard Business Review of July-August 1960, Levitt notes that many companies look upon their main activity as a goods producing process rather than as a customer satisfying process in a belief that there is no competitive substitute for what they produce. Companies devote much effort to lowering costs on the production level, but little effort to marketing. Marketing and selling are not the same thing—marketing is focused on satisfying the needs of the buyer, selling on satisfying the needs of the seller.

On this level it is easy to see that most segments of the mineral industry are sellers rather than marketers. If one takes as exceptions those producers who have gone out to find what the customer needs and to see how they can supply it—aluminium and perhaps nickel would be good examples—one finds that they may have troubles from time to time but that their markets are building up, and that their problems are not quite the same as those of producers who sell rather than market their material.

As might be expected, Levitt draws one of his main examples from the oil industry. He feels that the industry has severely restricted itself through continuing to conceive of its main product as petrol rather than as energy or fuel or transportation, and that since there is no guarantee against product obsolescence—"if a company's own research does not make it obsolete, another's will"—the oil industry will in time be in serious trouble. The industry's research is geared to improving oil fuels rather than to development of superior fuels based on other ingredients. He states "despite its pioneering work in developing and applying present-value method of investment evaluation, in employee relations, and in working in backward countries, the petroleum business is a distressing example of how complacency and wrongheadedness can stubbornly convert opportunity into near disaster". And we look upon petroleum as the most commercially enlightened branch of the mineral industry!

It is rather difficult for a mineral producer to take this liberal attitude towards the market, for his basic assets are mineral materials in the ground, and anything which wipes out the value of his reserves changes the whole complexion of the industry. But mineral materials do have unique characteristics which give them natural advantages in some raw material markets, and so there must be an intermediate zone in which we can strive to maintain and to expand upon these markets. We have good examples, in the history of the nickel industry and the post-war aluminium industry, of the possibilities of expanded sales when the industry follows an active pattern of searching for new areas of demand and new consumer uses which can be satisfied by mineral products.

It is true that the mineral industry has many research groups, but are they orientated towards the needs of the mineral consumers or to those of the producers? Many times such groups are geared to help consumers in the solving of problems which arise in use, but are they actively working on the search for completely new areas of use? There must be abundant opportunities in this rapidly changing world but the outlook of the industry is not always geared to take advantage of them—and markets do not have to come looking for mineral raw materials.

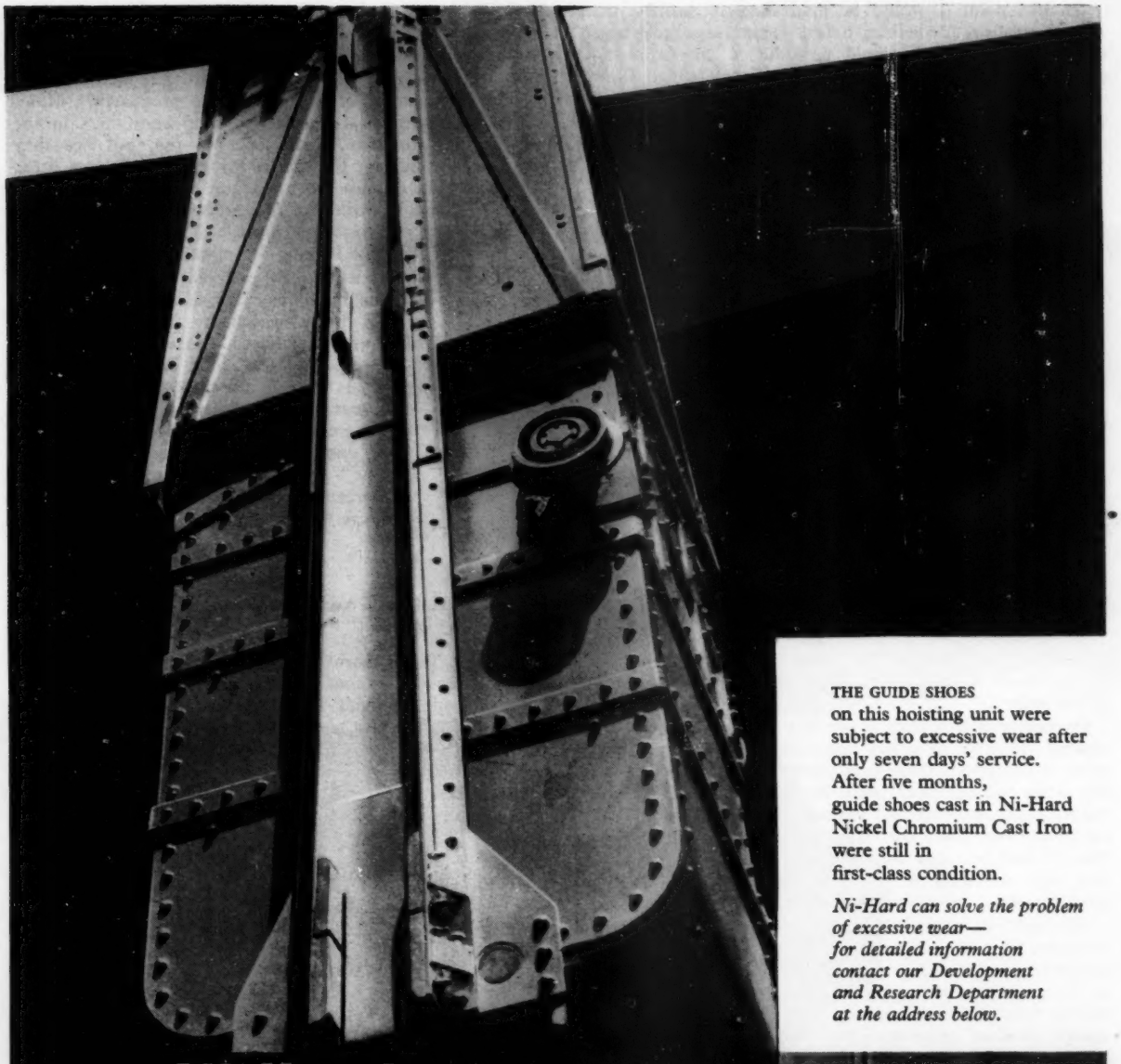
In fact, the competition for markets can be somewhat ruthless. Here one might examine some aspects of the campaign currently being waged by du Pont to gain acceptance for its new acetal resin "Delrin", a substitute for many metal uses, particularly zinc. What must be one of the more audacious steps in the attack appeared in the special lead-zinc issue of the *American Metal Market* (July 25, 1960) where facing an article titled "Zinc's Future is Brighter" one finds a full page advertisement extolling the virtues of "a new engineering material offering the user distinct performance and cost advantages in many applications once reserved for metals—Delrin."

**Customer Relations Now Paramount**

Faced with this sort of competition on many fronts the mineral industry cannot continue to coast along supplying the same old products for the same old uses, giving the same old service and terms, and through it all creating the same old impression with the public. It seems likely that most people who have any concept of the mineral industry see it as continually in trouble of one sort or another—threatened with strikes in remote parts of the world, accused of exploiting native workers, having to appeal to the government for a variety of special concessions—a generally unattractive picture which must affect the attitude of the potential consumer towards the reliability of the industry. Other industries have troubles from time to time, but they seem to be more clever in their public relations, as one doesn't hear so much about them.

There can be little doubt that the mineral industry has alienated many of its customers through complacency, lack of vision, indifference, or sheer stupidity. There can be little doubt that mineral raw materials have an important place in filling the needs of an industrial society, but this place is not a god-given one—it must be located, staked out, fought for, and continuously expanded. It is one part of the total market for raw materials, and it is that part of the total market in which the consumer has been convinced that minerals are his best raw material, not only physically but in terms of reliability, service, and a host of other features which are important to consumers.

The questions about mineral markets and marketing must be asked and answered, and the whole outlook of the industry must become orientated towards finding, or indeed creating, customer needs. Some of the large mineral producing companies have seen this, and are broadening their area of interest into other branches of the mineral industry or into non-mineral areas. The changes which must come about if the companies which make up the industry are to prosper in the future require a more vigorous and dynamic leadership than one usally finds in the industry, and growing out of this leadership a much broader attitude towards research—research not only to make production simpler and more economical, but to find new products which will fill new needs, and to find new needs which can be filled by mineral raw materials.



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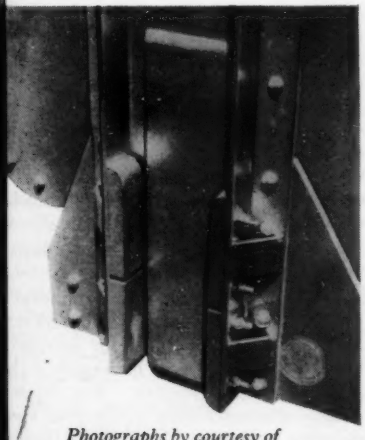

*Photographs by courtesy of Wabi Iron Works Ltd, Ontario show how guide shoes were fitted.*

**THE INTERNATIONAL NICKEL COMPANY (MOND) LIMITED, THAMES HOUSE, LONDON SW1**

TGA C137/1

# Sulphur from Lacq

DURING 1961 the programme of exploitation of natural gas at Lacq in south-west France is to reach its climax with an output of 20,000,000 cu. m. of crude gas a day. Since this crude gas is heavily laden with acid constituents, including 15.3 per cent $H_2S$ and 9.7 per cent $CO_2$, these are separated from the crude gas at a purification plant adjoining the gas field and this will permit, on completion of the final section of the plant, the recovery of some 1,400,000 tonnes of sulphur per annum.

Placed in operation in 1957, the first section of the plant has a treatment capacity of 1,000,000 cu. m. of crude gas a day; the second section, in operation since 1959, has a capacity of 4,000,000 cu. m. a day; the third section, placed in operation in 1960, has a capacity of 5,000,000 cu. m. a day, while the fourth and fifth sections, due for completion this year, will have a combined capacity of 10,000,000 cu. m. These various sections will produce 200 tonnes, 800 tonnes, 1,100 tonnes and 2,000 tonnes of pure sulphur a day respectively.

Treatment of the crude gas includes separation of the hydrogen sulphide and carbon dioxide, the recovery of sulphur from the hydrogen sulphide and the removal of gasoline from the methane.

In the first section of the gas purification plant at Lacq desulphurization is achieved by a process used under the name of Girbotol in the United States in which the acid gas is passed in counterflow to a 20 per cent solution of diethanolamine in a contracting column. In the subsequent sections, however, the acid gas is treated by a new method which is based on the fact that hydrogen sulphide and carbon dioxide are much more soluble in water than methane and the higher hydrocarbons. The acid gas content of the crude gas, is therefore, first reduced from about 25 per cent to about 10 per cent by water washing under pressure. The treatment with amines, which follows, is thus carried out on a gas containing far less acid gas. In these subsequent sections diethanolamine (DEA) is replaced by monoethanolamine, also in 20 per cent solution, which is more active. The wet washing unit, a feature of which is a substantial saving of steam, was designed and developed by the French company, the Société Chimique de la Grande-Paroisse.

Sulphur recovery from the $H_2S$ is achieved by a modernized Claus process in which the hydrogen sulphide is burnt in a steam generator to form sulphur dioxide, using air as the oxidizing agent and passing the mixture that is so formed into catalysis chambers charged with bauxite. Reaction occurs on contact with the catalyst at a temperature of about 220 deg. C. The sulphur obtained in the gaseous state is condensed and transported to steam-heated liquid sulphur pits which also receive liquid sulphur from the reaction-furnace stage. The liquid sulphur is subsequently withdrawn by special pumps to concrete storage yards with an area of 70,000 sq. m., on to the floor of which it is spread by flexible pipes. Before the sulphur is pumped on to the storage area an enclosure made up of fitting metal elements is built up there inside which the sulphur solidifies. When this has occurred the metal walling is removed and the mass of solidified sulphur is broken up and loaded by bulldozers for transport to French consumers or to the port of Bayonne for export. Loading can be carried out at the rate of 1,000 tonnes an hour. The sulphur yield at the Lacq plant is upwards of 95 per cent and the purity of the sulphur is better than 99.95 per cent.

**The No. 106 well at Lacq reaches a depth of 4,240 m.**

As in the case of the other units at Lacq the sulphur recovery plant has been built in the open air. Lagging is carefully carried out where necessary and protection against the weather is provided by a revetment of aluminium. Much automatic equipment is used to control the various phases of the operation, and all data is fed into a central control room.

At Bayonne-Blancpignon special port facilities were installed in 1959 to handle the export of sulphur. Initially, this dealt with about 25,000 tonnes a month. Since 1960, this rate has been doubled and unless something unforeseen happens, handling will continue in rhythm with the rate of production at Lacq to reach 1,100,000 to 1,200,000 tonnes a year by 1962. The sulphur is carried by the French railways in bulk in hopper wagons, constructed of light alloy, special loading and unloading equipment being provided at each end of the line as well as belt conveyors and a ship's loader with telescopic chute on the quay side.

The degree of purity of the Lacq sulphur makes it emminently suitable for the manufacture of sulphuric acid. As well as reducing the need to import large quantities of sulphurous materials, exports of Lacq sulphur are expected to yield appreciable amounts of foreign exchange running into some 15 milliards of French francs.

**Sulphur being shipped from the port of Bayonne, where up to date facilities permit the loading of 1,000 t.p.h.**

*Photograph by courtesy of the National Coal Board Opencast-Executive and Lomount Construction Limited*

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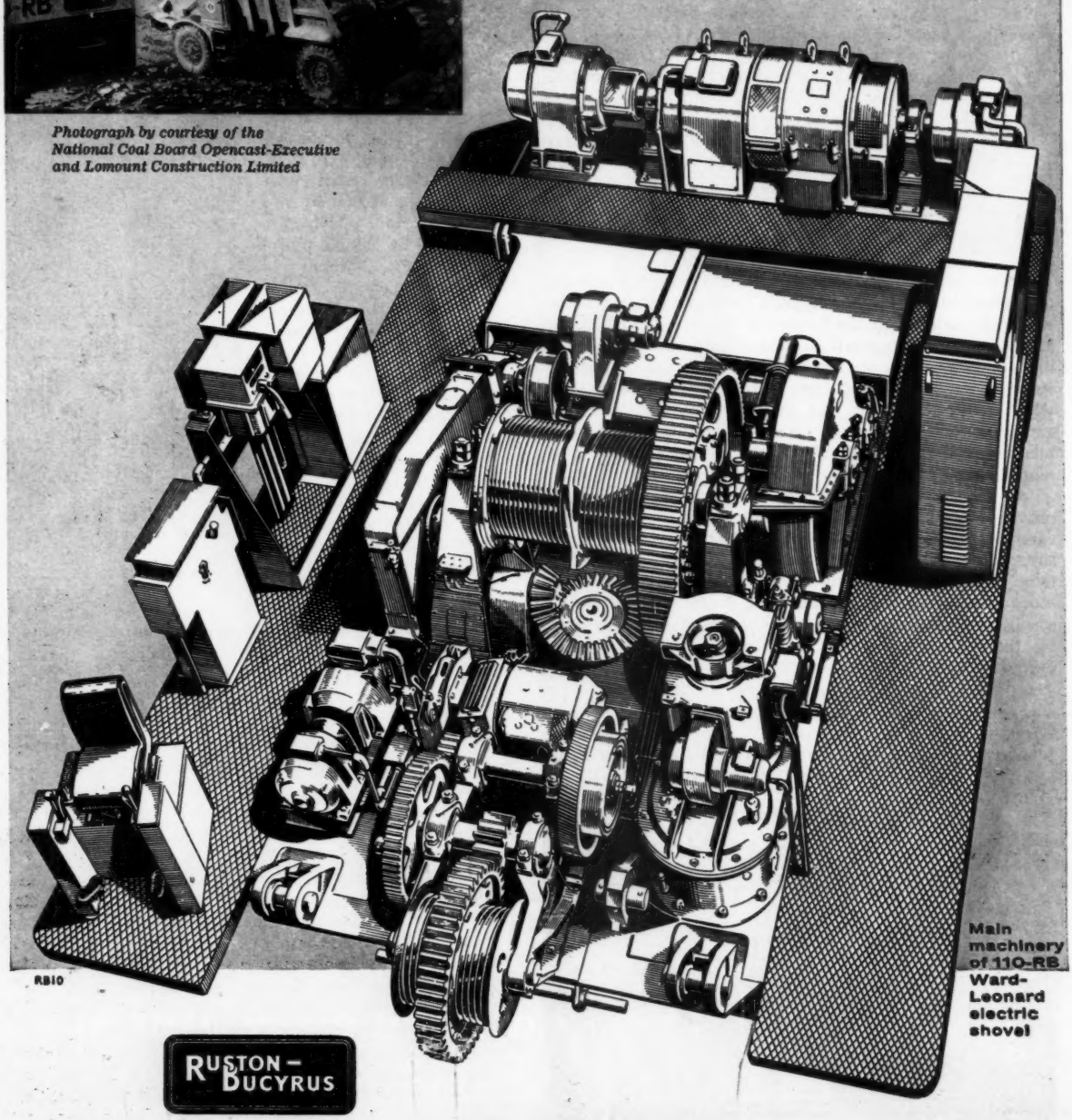

RB10

**Main machinery of 110-RB Ward-Leonard electric shovel**

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# *The Mineral Resources of British Borneo*

THE British Borneo Geological Report for 1959 prepared by the Geological Survey Department states that the year saw inrceased progress, both economic and scientific, new mineral resources having been prospected, new research started and new territory explored. Gold output almost trebled, bauxite production more than doubled and oil yield rose. Several companies either plan, or have started to spend, large sums for prospecting chromite, oil, copper and coal. A new quarrying and manufacturing industry was begun in North Borneo and a million-pound mobile drilling barge began a search for oil on the continental shelf below the South China Sea. Mineral exports rose in value to reach $M.354,910,000 and, forming 70 per cent of the total value of exports, yielded $M.102,530,000 in revenue to the governments. Total mineral production from the three territories, Sarawak, Brunei and North Borneo in 1959 was valued at $M.306,973,744 compared with $M.311,901,525 in 1958.

Minerals and mineral products obtained during 1959 were oil, natural gas, bauxite, gold, phosphate, bricks, lime and stone. Of the mineral resources worked, oil was of outstanding importance, Brunei production continuing to be the second highest in the Commonwealth, but the output of other minerals was still small, despite increases in bauxite and gold. Resources not worked were coal, diamonds, garnet, gypsum, pyrite, talc, kaolin, zircon, ilmenite, monazite and ores of antimony, arsenic, chromium, copper, iron, lead, manganese, mercury, silver and zinc. Coal appears to occur in sufficient quantity for mining, though several attractive deposits are too isolated. Mercury and antimony ores might repay working on a small scale

### Oil Exploration Continued

Oil production in 1959 from Brunei and Sarawak totalled 40,776,838 barrels. Some 40,483,842 barrels, valued at $M.37,306,809 were exported. Three associate companies of the Royal Dutch/Shell Group operate two main oilfields at Miri and Seria. There is a small well also at Jerndong in Brunei. Oil indications at shallow depth were discovered in the Marudi area of eastern Sarawak, but these have to be proved. A Japanese concern, Teikoku Oil Co. applied for exploration permits in North Borneo. Off-shore testing by the mobile drilling barge "Orient Explorer" was carried out from mid-1959.

Expenditure on exploration by the Shell Group totalled $M.11,656,000. Field operations totalled 12 party-months of surface geology and one party-month of gravity and continuous velocity surveys. Drilling totalled 28,961 ft. in three exploration wells, one in each of the three territories. Access and site preparation for futher exploration drilling in Sarawak and Brunei was also in progress.

### Higher Bauxite Production

Bauxite production increased to 206,848 l.tons, of which 202,925 l.tons were exported, more than doubling the 1958 exports. Bauxite has been found to date only in West Sarawak where over 20 occurrences are known. Three deposits are considered worth mining, one at Munggu Belian already having been worked for two years to yield 343,167 tons of ore. This mine is estimated to contain over 2,600,000 tons of washed bauxite. The ore occurs in a bed, 10 ft. thick, under a thin cover of soil and is worked by excavators and cleaned at a washing plant at Sematan. In 1959, a new washing plant was installed, giving, with the old plant, a maximum output of 1,500 tons in 24 hours. Other new equipment was expected to step up production and shipment of ore, allowing 300,000 tons to be exported in 1960. The possibilities of working the Bukit Gebong deposits, about 3½ miles away, which are believed to contain another 2,000,000 tons of washed bauxite, were considered in 1959, but no mining plans were made.

Prospecting for bauxite on a limited scale continued at Munggu Belian, Bukit Gebong and Tanjong Serabang. Pitting and drilling at the margins of the Munggu Belian deposit showed that the bauxite extends below both the river valley swamps and below the coastal terraces of white sand and that power-driven rotary drills could effectively be used to penetrate the bauxite beds. Prospecting has led to the discovery of a possible further 250,000 tons of ore at Munggu Belian but some of this is below considerable overburden.

### Increased Gold Output

Gold output almost trebled in 1959 and the number of operating mines increased to nine. This rise was due largely to the higher price received for the gold since sale has been allowed to registered dealers in Sarawak. Total production from the nine small Chinese mines at the Bau field in West Sarawak was 2,450 oz. Most of the mineralization here is restricted to small pockets and veins, often enriched by weathering. No large low-grade orebodies have yet been found. Gold is known to exist in North Borneo but, at present, is not thought to be of economic importance.

### The Coal Industry

Coal has been found in many places in British Borneo and, up to 1959, nearly 50 occurrences had been recorded. Four European-run collieries once worked in the region of Silimpopon, Labuan, Brooketon and Sadong. The best known present coal deposits in Sarawak are at Simunjan, in the Silantek-Abok area and in the Bintulu and Mukah districts; in Brunei at Brooketon on Maura Peninsula; also in North Borneo at Silimpopon near Tawau, on Labuan Island, and near Sandakan. Japanese companies sent geologists and mining engineers in 1959 to examine coal and other mineral deposits and these were to be continued in 1960. At the end of the year arrangements were in progress for a $M.1,000,000 coking-coal prospecting scheme to start at Silantek and Bintulu. A prospecting licence for the Silimpopon coalfield was issued to a private company.

### Chrome, Copper and Asbestos

Encouraging discoveries of lode deposits of chromite were made by a British company prospecting in North Borneo in 1959. Exploration is being increased and diamond drilling started. Copper was also found in the basic and ultrabasic rocks with which the chromite is associated. In addition, the survey's geochemical prospecting revealed extensions to known areas of sulphide mineralization. Several large overseas mining companies have applied for copper prospecting rights.

Short fibre asbestos has been discovered in North Borneo during routine geological surveying while stone and gravel continued to be found in new areas where supplies were needed, new quarries having been opened.

# STOP costs mounting -

# START

## using *Nylon* conveyor belting

Nylon heavy-duty conveyor belting reduces overall cost per ton carried. Nylon conveyor belting carries coal more efficiently, needs much less inspection and maintenance and has a longer working life. It's logical to change to nylon and start making a saving each working day.

Nylon conveyor belting has extra resistance to impact damage and abrasion of edges, higher tensile strength and energy absorption. It cannot rot, is unaffected by bacteria, is highly flexible, troughs better and allows smaller diameter drums to be used.

Its superiority to conventional belting is being established in all sorts of conditions in British coalmines and elsewhere.

For toughness and durability, there's nothing like nylon re-inforced belting. Ask your regular supplier about it. Also, British Nylon Spinners Limited, as makers of the original nylon yarn, will be pleased to receive enquiries about the use of nylon in conveyor belts. Just get in touch with Industrial Sales, British Nylon Spinners Limited, 68 Knightsbridge, London, S.W.1.

**The belt seen working here** is a Fenaplast belt running at Havannah Colliery of Northern (N&C) Division. It is fitted to a 30" wide Beaumont Mothergate conveyor which has a 'top and bottom length' of 2,560 yards. It has now been running for more than a year without any fault.

IT'S *Nylon* FOR STRENGTH (B Nylon S)

***Machinery and Equipment***

# Fast Ore Removal

The Kennecott Copper Corporation at Ruth, Nevada, now has a fast and efficient method of moving ore from the lower levels of its Liberty pit. Installed at a cost of about $1,500,000, a new inclined skip hoist speeds 25 tons of copper ore out of this large mine in about one minute as compared to 10-15 minutes by truck. The skip hoist now carries more than 12,600 tons of ore a day out of the pit—or approximately 60 per cent of daily ore production.

Describing the installation in full detail, *The Northern Miner* reveals that the trackway for the skip system from the loading point to the dumping point is 1,234 ft. long with a vertical raise of 405 ft. to the top of the headframe. The loading station at the bottom is on the 6,704 level of the pit and provisions have been made to extend the skip deeper if needed. Two 25 ton skips weighing 39,490 lbs. each are used.

The steel headframe of the system is located on the edge of the pit on the 7,033 level. It contains two separate storage bins each with a level capacity of 100 tons and a surge capacity of 180 tons, and each serviced by a standard gauge railroad track for railway car loading.

The hoist is a double drum cylindrical model with an expanding toggle type clutch coupling the two drums. Each drum is 11 ft. in dia. with an 8 ft. width, grooved for 1¼ in. hoisting cable. Each drum is mounted on a separate drum shaft, the drum shafts being connected by means of the toggle clutch located between the drums. Braking of the skips is accomplished automatically by two methods in two steps.

The maximum carrying capacity of the system is 1,120 tons per hour based on a 47 minute operating hour. The total cycle time is 65 seconds: 12 seconds for acceleration, 10 seconds for retarding and 7 seconds rest. The rope speed is 1,630 ft. per minute. The advantages of the system include: reduced stripping ratio required for pit expansion over haulage methods since only limited access and service roads are required in reaching final pit limits; elimination of the need for maintaining benches for railroad tracks or haulage roads; greater flexibility in mine planning; lower pit equipment capital and maintenance costs; minimizing ore car maintenance on the pit to reduction plant rail haul due to decreased loading damage as well as an improved load factor; and greater productivity.

## SPECIAL METALS AT MOSCOW

A British exhibit at the Moscow Trade Fair will be the display of special metals and products, and their various applications, by Telcon Metals Ltd. This company is a member of the British Insulated Callender's Cables Ltd., group.

The Telcon Metals organization produce high permeability alloys and nickel-iron compositions for a wide range of engineering industries. A range of thermostatic bimetals is also manufactured. These are to be displayed on the stand, together with a selection of glass-to-metal sealing alloys. Telcon Metals is a foremost producer of beryllium copper alloys, amongst which the 2 per cent beryllium copper has non-sparking properties which make it indispensable in the form of safety tools in the manufacture of various commodities including explosives.

Visitors to the fair will also see special displays by Magnetic and Electrical Alloys Ltd., Telcon-Magnetic Cores Ltd., subsidiary companies of Telcon Metals. Thomas Bolton and Sons Ltd. and Connollys (Blackley) Ltd., both members of the BICC group, will be well represented on the stand.

## NEW TWO-UNIT EARTHMOVER

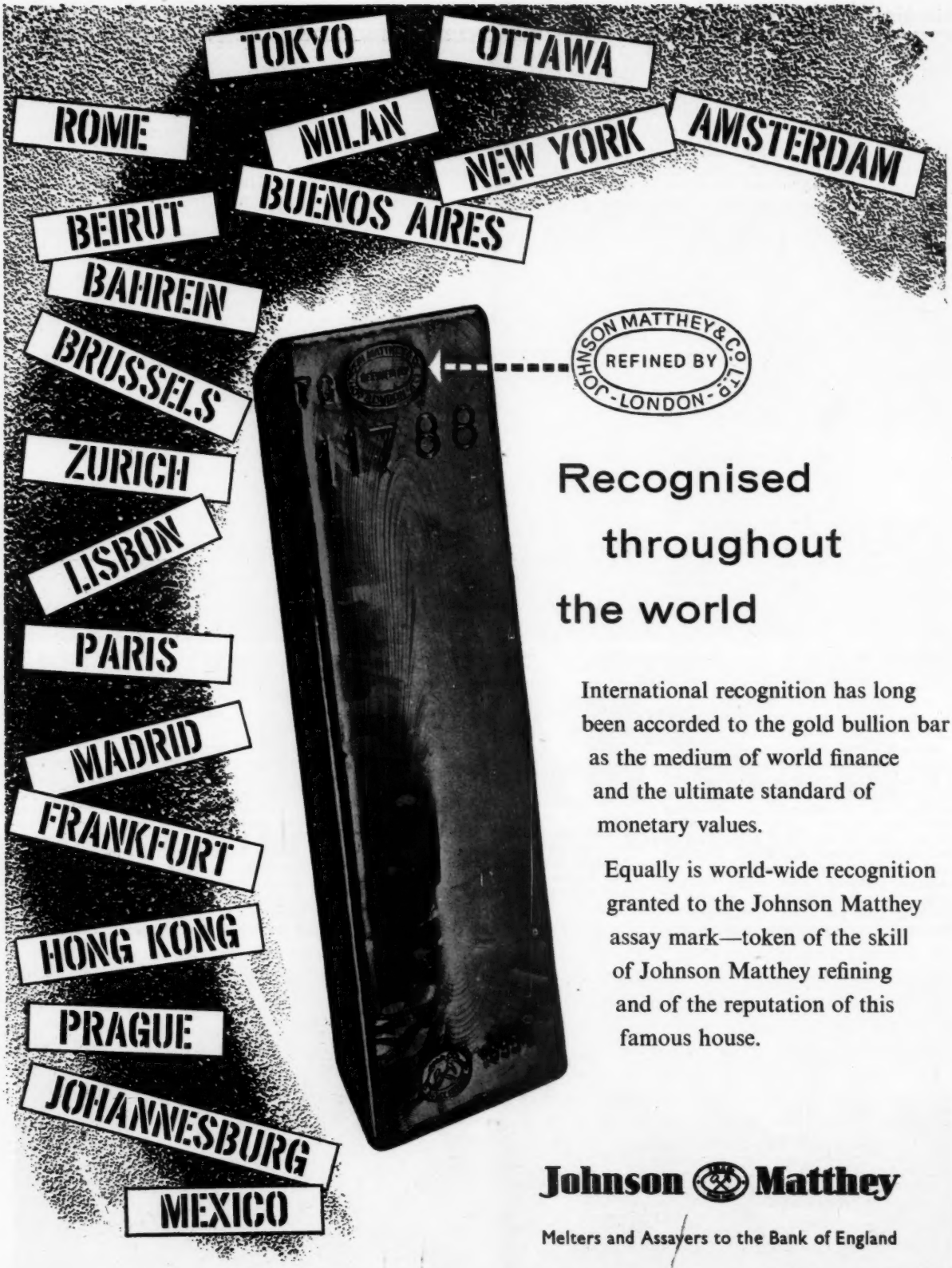
A method of earthmoving favoured today by many operators is the tractor drawn dumper. A recent development in this field is the introduction by Mackay Industrial Equipment Ltd. of the Morewear Goose. Mackay, now the sole distributors, claim that the Goose, manufactured by R. Smith (Horley) Ltd., is the first British detachable, self-loading dumper, and has been developed as a unit of the highest efficiency at the lowest possible cost. By utilizing one of the most modern of diesel tractors, the new Fordson Super Major, a complete unit has been developed to pull heavy loads at low running costs, and to eliminate expensive maintenance on conventional earthmovers.

Basically the Goose consists of a ruggedly constructed tipping body carried on a two-wheeled H frame chassis which is coupled to the power unit by a gooseneck extension. One of the features of the design is the actual connection between the power unit and the tractor. This is a quick-release ball coupling which permits the dumper to be detached from the tractor in less than 90 seconds. This coupling gives the Goose considerable versatility, as one tractor can handle several dumper units, or be used for other duties. Full advantage of the quick release coupling is obtained when the tractor is fitted with hydraulic shovel equipment. This enables the dumper to become a completely self-contained loading, hauling and dumping unit, operated by only one man.

To take further advantage of the quick release feature, a telescopic hydraulic jack is built into the base of the gooseneck, which is completely retracted when not in use, and when the dumper is to be uncoupled the jack is quickly lowered to support the front of the dumper. When the detached dumper is being loaded, additional support can be given by lowering two loading stands which are bolted to the main frame. The gooseneck coupling on the tractor is beneath the driver's seat and its effective load is transferred to the tractor 3½ in. ahead of the rear wheel centres. Thus increased traction and stability is obtained.

The dimensions and design of the gooseneck are such that exceptional manoeuvrability is achieved, of a standard claimed as unknown to the conventional type of tipping vehicle. Over 100 deg. articulation each side can be obtained, which means that time is saved where loading and dumping space is confined. A fully welded main chassis frame to which the gooseneck is welded, is made up of 8 in. x 3 in. rolled steel channel and the body frame is of 6 in. x 3 in. rolled steel channel. The dumper

**The Goose combination**

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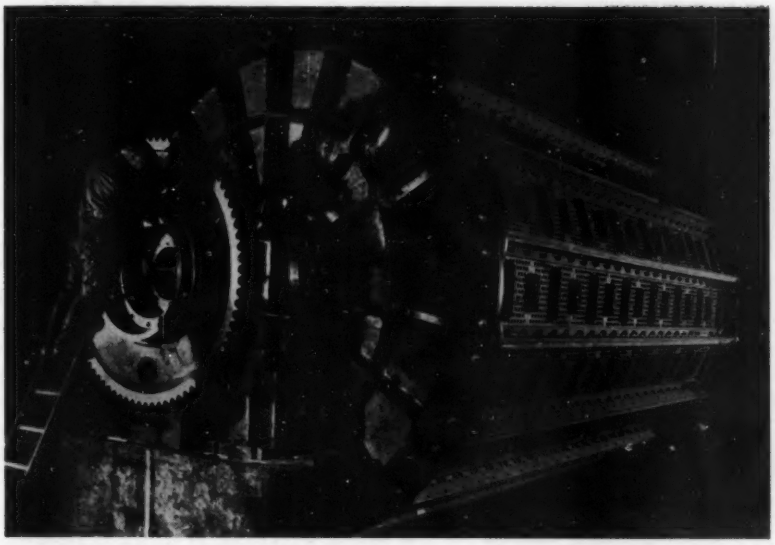


**Erecting the 14 ft. dia. 22 ft. long Bradford breaker for Richard Thomas and Baldwins Ltd., at the Fraser and Chalmers engineering works of G.E.C.**

body has been designed to hold 5 to 7 cu. yds. or 8 to 10 tons. The floor is of ¼ in. mild steel plate continuously welded to the sides and the frame, and the sides and side board extensions are of $\frac{3}{16}$ in. mild steel plate. The sides and the floor are reinforced with external welded box section members.

Hydraulic power from the tractor operates the low pressure ram of the simple and rugged tipping gear. The ram operates in the centre of the lifting arm plates and converts the backward thrust into a true upward lift. This method ensures a smooth tip with complete absence of backward thrust on the hinge plates and hinge pivots. This compound leverage hoist works at a maximum pressure of 2,000 p.s.i. and gives a 60 deg. tip of the body ensuring complete ejection of the stickiest materials. The control lever is situated adjacent to the driver's seat.

The Smith clam gate tail board is automatically operated each time the body is raised and lowered. This device is particularly suitable when light materials such as coke or coal are being carried or when there is the possibility of spillage when travelling on the roads. The Smith clam gate can also be obtained with a water tight seal, an additional feature, for the carrying of slurry and other semi-fluids.

The complete unit has an overall length of 22 ft. 11 in. The dumper unit only shows the following statistics; overall length, 15 ft. 6 in.; width, 7 ft. 6 in.; height, 6 ft. 3 in., weight, 2 tons; and a ground clearance of 1 ft. 9 in.

With these facts in mind, it would appear that the Goose has definite application in the mining industry. Indeed, the unit has been subjected to a rugged baptism of fire at the Kariba project, where conditions might be likened to an opencast site or quarry floor. The machine is cheap to manufacture, and at the stated market price is presented as being able to earn its keep in a comparatively short working life.

The picture is bright in so far as sales are concerned. Because it is constructed in two parts, namely the Fordson motivating unit and the dumper, the Goose can if desired be regarded as two commodities. Sales of dumpers as separate entities can be made to those countries where Fordsons are manufactured indigenously.

Sales to overseas customers will be made through the existing channels, all countries offering possible markets. Representation in Finland provides possible access to the Iron Curtain countries.

## COAL CRUSHER

Under construction in the Fraser & Chalmers engineering works of The General Electric Co. Ltd., at Erith, is a 14 ft. dia., 22 ft. long Pennsylvania spider-mounted Bradford breaker. It will be used for crushing coal in the coking plant being built at the new Spencer Works of Richard Thomas & Baldwins Ltd., near Newport, and is being supplied by G.E.C. through Mitchell Engineering Ltd.

The machine, which is the largest of the Bradford breaker range will act as a primary crusher, receiving run-of-mine coal up to 12 in., at a rate of 600 tons per hour, and giving a product size of −1½ in. The machine is capable of accepting 30 in. lumps.

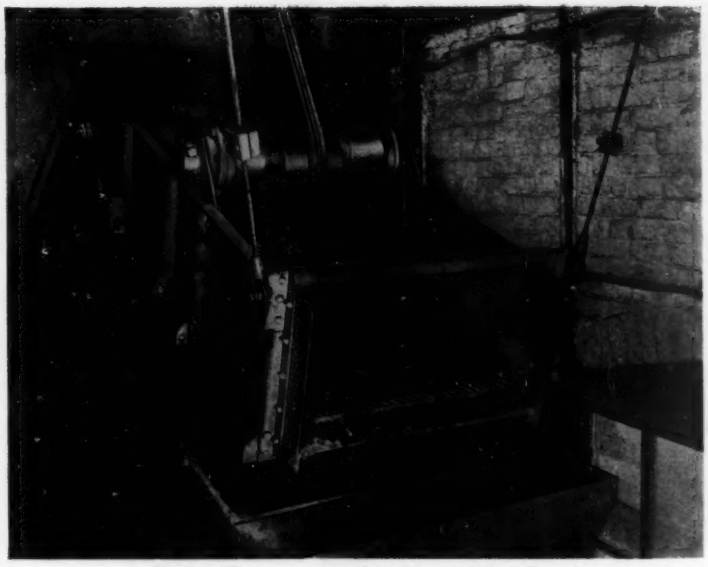
## NEW EXPLOSIVES FOR SEISMOGRAPH EXPLORATIONS

The new explosives for use in seismograph exploration are now available from the Mining Chemicals Department of Cyanamid International. They are Cyamon S blasting agent and Cyamon S primer.

The new blasting agent is a nitro-carbo-nitrate that requires a primer for detonation. Packaged in hermetically sealed cylindrical containers, it has a moderate to high degree of resistance to water pressure and stands up well during storage. Each cylinder is threaded to permit easy coupling for the forming of column loads. Depending upon the column length of the charge and the practice of the seismic shooter, occasional booster primers may be added.

Cyamon S primer can be coupled to Cyanamid's new blasting agent through the threaded connections of its cylindrical metal package. The female end contains a recessed well for cap insertion that will accommodate any seismic cap now available. Cyamon S blasting agent is supplied in 2 in. x 1 lb. and 2½ in. x 1 lb. blue metal containers. Cyamon S primer is packaged in red metal containers that are also available in both the 2 in. x 1 lb. and 2½ in. x 1 lb. size.

**Seen being loaded with bagged fluorspar, this Leyland Octopus 240.4 has just been added to the fleet of Glebe Mines Ltd., of Sheffield, part of the Laporte Industries Group. The truck is fitted with a step-up auxiliary gearbox to enable it to take full advantage of the high speeds which will be possible when the Ross-Spur motorway is opened. The fluorspar is mined and processed at the company's mine in Eyam, Derbyshire**



*Photograph by courtesy of the National Coal Board*

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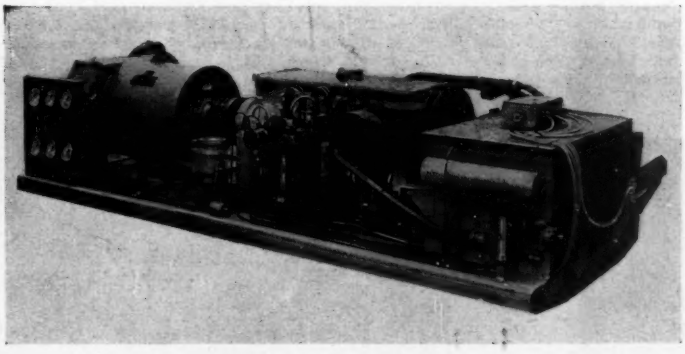

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# MINING MISCELLANY

A meeting of 16 experts on safety and accident prevention in mines has been held by the International Labour Organization in Geneva recently. Governments, employers and workers' organizations were represented, and discussions covering many technical aspects of disasters, including their causes and prevention, were held under the chairmanship of Mr. M. A. Vandenheuvel, director-general of the Administration of Mines of Belgium.

★

Lava samples from Tanganyika's only active volcano, Oldoinyo Lengai (9,443 ft.) in Masailand, which were collected by two geologists of the Geological Survey Division, are being studied for pyrochlore-bearing carbonatites.

★

Noranda Mines have signed a seven-year contract, permitting eight Japanese manufacturers to buy up to 7,000,000 tons of iron ore of 68 per cent purity at $8.80 per ton, to be mined in Canada on Maggie Lake property at Ucluelet, on the west coast of Vancouver Island.

★

Anaconda Iron Ore (Ontario) is testing its 23-mile long orebody, 35 miles north of Nakina. Nakina is about 165 miles northeast of the Lakehead in northwestern Ontario. The orebody contains an estimated ultimate reserve of 2,000,000,000 tons of low-grade magnetite.

★

South African Railways are proceeding with plans to make Port Elizabeth a fully mechanized ore-loading port. An order has been placed with Robins Conveyors (South Africa) (Pty.) for special plant costing £721,949, designed to offload trucks and to stockpile the ore at the rate of 1,500 t.p.h. Two dumpers or tipplers will handle 750 t.p.h. From the dumpers, the ore will be conveyed by belts to the stockpile area, where 184,000 tons of ore can be stored. Ships' loaders will be able to load ore at a rate of up to 750 t.p.h.

★

Mexican mineral production in the first eleven months of 1960 was as follows: gold, 278,957 troy oz. (compared with 290,840 troy oz. for the same period in 1959); copper, 56,061 tonnes (56,439); lead, 175,977 tonnes (174,168); and zinc 246,378 tonnes (252,889). Petroleum production during the first ten months of 1960 amounted to 91,515 U.S. barrels, compared with 105,954 in the same period of 1959. A new uranium deposit, stated to be rich, has been located in the State of Durango, in an area known as the "Cerro de la Cal".

★

TAMSA has announced that it is to establish an aluminium refining plant in Veracruz Mexico, through a subsidiary company, Intercontinental S.A.

★

Congress of Nicaragua is studying proposed legislation to regularize mining concessions, which would oblige concessionaires to undertake a minimum of investment in prospecting and to establish "discoverers' rights", by which rewards would be paid for mineral discoveries. The Nicaraguan Geological Services have announced the discovery of large tungsten deposits in the Department of Las Segovias, which are not yet being worked.

★

The National Coal Board reports that their film "New Power in their Hands" has been selected as one of the two U.K. entries for the 1961 Eurovision Grand Prix of Television Films.

★

The Pakistan Government have approved plans for the extension of surveys of mineral fuel and water resources in Pakistan, the cost of the scheme amounting to Rs. 29,000,000. The Pakistan Industrial Development Corporation are to develop a colliery in the Sor Range in former Baluchistan, with an output of 1,000 tons of coal daily.

★

The monopoly of diamond mining in Tanganyika held by Williamson's Diamond Mines ends in 1961. The territory has been divided into 24 blocks, averaging 15,000 sq. miles each, and Williamsons are to have prior choice of four blocks during the first six months of this year. Each applicant must give an undertaking to spend £30,000 per annum on each block, and prospecting for minerals other than diamonds may also be undertaken.

★

Kilembe Mines have discovered, by underground exploration, a new copper deposit in Uganda. The value of Kilembe's copper exports during 1960 is provisionally estimated at £3,289,000 compared with £2,711,000 in 1959.

★

During 1960, Denmark increased her coal imports by 40 per cent, to almost 4,000,000 tons (2,800,000 tons). Coke imports also increased, by 15 per cent, to 1,400,000 tons.

★

The United Nations Special Fund has granted Iran $1,425,000 for the further expansion of its Geological Research Institute, to which Iran is to contribute a further $2,200,000.

★

A local subsidiary of Aluminium Co. of America has been awarded a contract for construction of an ore loading wharf at Rocky Point, in Clarendon parish, Jamaica.

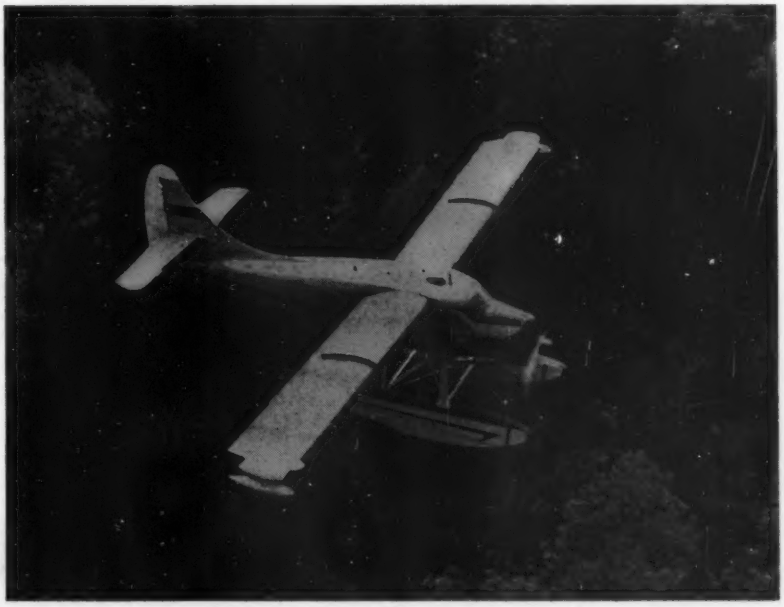
★

The Philippines Department of Commerce and Industry has announced that Broken Hill Proprietary Co. of Australia is looking into prospects of obtaining iron ore supplies from the Philippines.

★

Fersmite, a rare columbium mineral, has been discovered in the Bitterroot Mountains of Ravalli County, Montana, U.S.A. This mineral was previously only found in the Russian Ural Mountains. Montana fersmite crystals contain, according to a U.S. Bureau of Mines report, 75 per cent oxides of columbium; 15 per cent calcium, and smaller quantities of rare earths, and other minerals, but no tantalum.

**Canadian Aero Service Ltd., announced on March 17, the formation of a Toronto subsidiary, Canadian Aero Mineral Surveys Ltd. This new company will provide broader airborne and ground geophysical facilities to the mining exploration field. The new company will offer a choice of three airborne exploration units including Otter, Canso and S-55 helicopter. Canadian Aero Mineral Surveys will be under the direction of Mr. D. M. Wagg, formerly Chief Geophysicist of Rio Tinto Mining Co. of Canada. The company's Otter, here illustrated, carries electromagnetometer and magnetometer at survey altitude, about 200 ft. above terrain, and can be equipped with floats, wheels, or skis for year round survey flying**



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## *Metals and Minerals*

# Sharp Increase in Cobalt Sales

Last year two events of major significance to the Free World cobalt industry took place. One was the Cuban Government's seizure of the Freeport Nickel Co.'s plant at Moa Bay, which was to have a production capacity of 25,000 s.tons of nickel and 2,200 s.tons of cobalt annually. The other was the emergence of the Congo Republic as an independent State which, however, has so far had little effect on cobalt production, despite the chaos which followed the transfer of power.

These two developments lend enhanced interest to a survey entitled "The Cobalt Market in 1960", which apears in the March, 1961, issue of *Cobalt*, the quarterly review published by the Cobalt Information Centre.

The leading producer in 1960 was again Katanga (9,083 s.tons of contained cobalt), followed by Northern Rhodesia (1,929), Germany (1,640), Canada (1,729), Morocco (1,475) and U.S. (885).

At 16,800 s.tons, Free World cobalt production in 1960 did not quite come up to the high level attained in the previous year. The producer countries for which the decrease was most marked were the U.S. (where the full impact of closing down the Calera Mining Co.'s mine and refinery was only felt last year), and Northern Rhodesia, because of the lower-grade cobalt concentrate treated. Production in Katanga was almost normal. These losses were counter-balanced in part by increased outputs in Canada (in spite of Deloro Smelting and Refining Co. closing its smelter in the later half of 1960) and in Morocco. Finally, the postponement of Freeport Nickel's Moa Bay operations prevented the increase in cobalt production that was generally anticipated at the beginning of 1960 from becoming effective.

The salient feature of last year, states the survey, or, to be precise of the last two years, was the sharp increase in the total sales of cobalt to industry. It has been estimated that, in 1959, these sales amounted to more than 12,000 s.tons, whereas they had fluctuated around a figure of 9,500 s.tons for the three preceding years. In 1960, sales to industry probably amounted to between 14,000 and 14,500 s.tons. The U.S. did not participate in this rise in industrial consumption, for which Europe was mostly responsible.

The vigorous promotion campaign carried out over the past four years is regarded as unquestionably figuring among the determining factors of this evolution, which was also assisted, to some extent, by a decrease in the price of cobalt, which became effective on March 1, 1960. (Cobalt is currently quoted in the U.K. at 12s. a lb.).

Increases in cobalt output for the coming years are already foreseen by some of the producers to meet the growing industrial demand. In this connection, operation's at Union Minière's new electrolytic cobalt plant at Luilu are due to start during the latter part of 1961. The planned annual capacity is 4,000 s.tons. It is also hoped that Sherritt Gordon will be successful in developing a special circuit to process the Canadian silver-cobalt ores previously smelted by Deloro.

A breakdown of U.S. consumption by uses, taken from the U.S. Bureau of Mines statistics for the first ten months of 1960, shows that metallic uses accounted for 76.4 per cent of the total usage and non-metallic for 23.6 per cent. Of the metal uses high-temperature alloys accounted for 22.4 per cent, cutting and wear-resisting alloys for 2.9, magnet materials 26.7, hardfacing rods 5.1, cemented carbides 3.7, high-speed steels 1.8, other tool steels 0.6, other alloy steels 6.3, non-ferrous alloys 1.2, and other metallic uses 5.7 per cent.

### RHENIUM-MOLY ALLOYS

Commercial production of rhenium-molybdenum alloys for use in electronic, and electrical equipment and in space satellites and guided missiles has been announced by Chase Brass and Copper Co. The alloy, roughly 50-50 in composition, will sell at a considerably lower price than pure rhenium products.

Most of the failures in filaments and grids in electronic tubes result from embrittlement caused in the wire by recrystallization at high temperatures. Rhenium-molybdenum alloys are not subject to embrittlement upon recrystallization as in the case of tungsten and pure molybdenum, most commonly used in such equipment.

Chase Brass claims to have been the first company to produce wrought rhenium, an extremely dense, silver coloured metal with a very high melting point of 5,756 deg. F. Only tungsten has a higher melting point. With strength and ductility combined with excellent electrical properties, even at high temperatures, the new alloy has been described as a major advance in this field.

### UPGRADING BERYLLIUM ORES

A significant upgrading of Colorado beryllium ores to as much as 35 per cent beryllium oxide has recently been made on an experimental basis reports the U.S. Beryllium Corp. of Pueblo, Colorado. Earlier reports on the concentration of low grade U.S. domestic deposits of complex beryllium minerals had indicated upgrading to far less than 35 per cent, and some even under 12 per cent.

This latest experimental development has been achieved by Mineral Concentrates and Chemical Co. of Denver, known as Mincon, which is in the process of building a concentrating mill to process the Badger Flats deposits. Initially, the mill may work up to 50 tons a day and samples have already been made available to Beryllium Corp. and Brush Beryllium.

At the A.I.M.E. convention in St. Louis recently, it was stated that in time the U.S. could become self-sufficient in minerals required by the domestic beryllium metals industry compared with indigenous supplies of less than 10 per cent at present.

Yet another American company, Mineral Concentrates and Chemicals Co. Inc., Denver, claims to have developed a new process to concentrate low grade

# LONDON METAL AND ORE PRICES, APRIL 6, 1961

## METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 250s. 8d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium. 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28/£28½
Quicksilver, £69 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79½d. f. oz. spot and 80d. f'd.
Tellurium, 28s. 6d. lb.

## ORES AND OXIDES

| | | | |
|---|---|---|---|
| Antimony Ore (60%) basis | | | 25s. 0d./27s. 6d per unit c.i.f. |
| Beryl (min. 10 per cent BeO) | | | 250s./260s. per l. ton unit BeO |
| Bismuth | | | 65% 8s. 6d. lb. c.i.f. |
| | | | 18/20% 1s. 3d. lb. c.i.f. |
| Chrome Ore— | | | |
| Rhodesian Metallurgical (semifriable 48%) | (Ratio 3 : 1) | | £15 5s. 0d. per ton c.i.f. |
| " Hard Lumpy 45% | (Ratio 3 : 1) | | £15 10s. 0d. per ton c.i.f. |
| " Refractory 40% | | | £11 0s. 0d. per ton c.i.f. |
| " Smalls 44% | (Ratio 3 : 1) | | £13 5s. 0d. per ton c.i.f. |
| Baluchistan 48% | (Ratio 3 : 1) | | £11 15s. 0d. per ton f.o.b. |
| Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1) $Nb_2O_5$ : $Ta_2O_5$ | | | 165s./170s. 0d. per l. ton unit c.i.f. |
| Fluorspar— | | | |
| Acid Grade, Flotated Material | | | £22 13s. 3d. per ton ex. works |
| Metallurgical (75/80% $CaF_2$) | | | 156s. 0d. ex. works |
| Lithium Ore— | | | |
| Petalite min. 3½% $Li_2O$ | | | 50s. 0d./55s. 0d. per unit f.o.b. Beira |
| Lepidolite min. 3½% $Li_2O$ | | | 50s. 0d./55s. 0d. per unit f.o.b. Beira |
| Amblygonite basis 7% $Li_2O$ | | | 75s./85s. per ton f.o.b. Beira |
| Magnesite, ground calcined | | | £28 0s./£30 0s. d/d |
| Magnesite Raw (ground) | | | £21 0s./£23 0s. d/d |
| Manganese Ore Indian— | | | |
| Europe (46%-48%) basis 60s. 0d. freight | | | 73d./75d. c.i.f. nom. |
| Manganese Ore (43%-45%) | | | 69d./71d. c.i.f. nom. |
| Manganese Ore (38%-40%) | | | nom. |
| Molybdenite (85%) basis | | | 8s. 11d. per lb. (f.o.b.) |
| Titanium Ore— | | | |
| Rutile 95/97% $TiO_2$ (prompt delivery) | | | £25 10s. 0d. per ton c.i.f. Aust'n |
| Ilmenite 50/52% $TiO_2$ | | | £11 10s. per ton c.i.f. Malayan |
| Wolfram and Scheelite (65%) | | | 118s. 0d./123s. 0d. per unit c.i.f. |
| Vanadium— | | | |
| Fused oxide 95% $V_2O_5$ | | | 7s. 6d./8s. per lb. $V_2O_5$ c.i.f. |
| Zircon Sand (Austalian) 65-66% $ZrO_2$ | | | £16 ton c.i.f |

beryllium ore. At its plants in Loveland and Berthoud, Colorado, the company is already producing on pilot scale using what is described as a "heat flotation method", which, in experiments lasting over many months, shows extraction with over 90 per cent beryllium recovery.

Recently United Technical Industries announced that it would shortly start commercial mining, milling and concentration of complex beryllium oxides using in contrast what is believed to be an ion exchange process. Among other U.S. firms active in this field are Vitro Minerals and U.S. Beryllium and Beryllium Resources.

### U.S. QUICKSILVER INDUSTRY IN 1960

Quicksilver production in the U.S. in 1960 totalled 32,930 flasks, reports the Bureau of Mines, U.S. Department of the Interior. This was a gain of 5 per cent. General imports of quicksilver in 1960 declined for the fourth successive year; receipts totalled 19,500 flasks and were the lowest since 1947. Spain and Italy supplied 81 per cent of the total imports. Consumption of quicksilver fell by 9 per cent to 49,700 flasks. Consumers' and dealers' stocks rose during the year from 11,700 to 13,000 s.tons. The annual average price in 1960 was $210.76 a flask; this was $16.72 below the 1959 figure and was the lowest average price since 1953.

★

Johnson, Matthey and Co. Ltd. are now producing on a commercial scale two grades of mercury for laboratory and industrial use following the installation of new equipment. One is redistilled mercury which has a maximum impurity content of five parts per million (mostly copper and silver), the other, triple-distilled mercury with a maximum impurity content of one part per million. Every batch is examined spectographically to ensure that the limits are not exceeded. The metal is suplied in 7, 14 or 28 lb. containers, though other packings can be provided.

Johnson, Matthey has become associated with Cowan Brothers, which will result in widening the range of their products to include lead, zinc, barium and strontium chromes as well as lead and zinc chromes.

★

Silver, 99.999 per cent pure is now being offered to industry for semiconductors and other applications by High Purity Metals, Inc., the ultra pure metals division of Accurate Specialities Co., New Jersey, U.S. The silver is produced by using a new atomic recombination process, and is available in fine crystalline powder.

### CUBAN NICKEL PLANT BLOWS UP

Just about the time when Inco was celebrating the official opening of its nickel plant at Thompson, Manitoba, reports reached the U.S. that part of the nickel-processing plant at Nicaro, seized last year by the Cuban Government, blew up after engineers raised the pressure on one of the processing towers.

The $110,000,000 Nicaro plant, owned by the U.S. Government, apparently had been operating at about 70 per cent capacity at the time of its confiscation but, since it had been built by the U.S. Government, Soviet engineers ran into difficulties when it came to replacing worn parts. While one report states that the capacity of Nicaro was reduced by 20 per cent as a result of the explosion, another conflicting report says that the plant had already closed down because replacement brushes for generators and motors could not be obtained, and that in any case it had been operating at only 25 per cent capacity after the old portion had been cannibalized to operate the new.

Whatever success the Cubans had with Nicaro, it is presumed that any nickel produced has been exported to Soviet *bloc* countries and possibly to China. Nicaro had previously been producing about 20,000 s.tons annually and just over a year ago the Cuban Government placed all output under official control.

### CAESIUM FOR SATELLITES

A $130,000 contract has been awarded to Royal Industries Inc. by the U.S. Atomic Energy Commission for the manufacture of a five watt power supply for earth satellites and space rockets. The power supply unit of one cu. ft. would obtain its energy from the radioactive decay of Caesium-137, a waste fission product of nuclear reactors and, according to Mr. J. R. Johnson, president of the company, it would provide five watts of energy continuously for 10 years without recharging.


**MAP OF THE GOLD MINES OF THE KINROSS AREA**

Copies of this map, prepared by *The Technical Map Service* of Johannesburg, are now available in London. They show (as at November 1959):-

- the exact position of each mine on the field.
- where on each property boreholes have been sunk, and what has been the core recovery on reef intersection.
- what shafts are being sunk.

Accompanying this map is a small outline map, bringing the borehole results up-to-date as at October 1960.

★While a mine is at the development stage, it is of vital importance to have a visual picture of its position in relation to the field as a whole. Otherwise the quarterly results published by the companies lose much of their significance.

★Results reported from adjacent mines often have a direct bearing on the one in which you are interested, which, however, can only become apparent if you have clearly in mind the position of the properties in relation to one another.

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# Copper · Tin · Lead · Zinc

*(From Our London Metal Exchange Correspondent)*

The market re-opened on a satisfactory note when business was resumed after the Easter weekend holiday. In the absence of any new developments to support the upward trend, it can best be attributed to the general feeling of confidence in the future. As far as copper is concerned, U.S. fabricators report a much improved level of orders and both the customs smelters and producers' price at 29 c. is expected to be maintained. Increased offerings of scrap copper have resulted in a ½ c. reduction in the price to 23¼ c. but, at the lower level, less metal was forthcoming.

On Thursday the Eastern tin price was equivalent to £833⅛ per ton c.i.f. Europe. Tin consumption in the U.S. in January totalled 5,965 tons which is a 21 per cent increase compared to the month before.

The British Bureau of Non-ferrous Metals Statistics for February were issued during the week and were (in tons):

| | *Feb.*, 1961 | *Jan.*, 1961 |
|---|---|---|
| *Copper:* | | |
| Consumption ... | 55,946 | 59,155 |
| Stocks ... ... | 114,919 | 122,694 |
| *Lead:* | | |
| Consumption ... | 30,430 | 31,145 |
| Stocks ... ... | 62,928 | 68,856 |
| *Zinc:* | | |
| Consumption ... | 28,118 | 28,737 |
| Stocks ... .. | 59,958 | 63,152 |

U.K. official warehouse stocks last week increased in the case of copper by 122 tons to 14,972 tons and by 1 ton of tin to 10,264 tons. Duty free stocks of lead also increased by 450 tons to 7,464 tons, whilst bonded stocks declined 24 tons to 3,843 tons. Similarly in zinc, duty free stocks increased 436 tons to 3,976 tons whilst bonded stocks were unchanged at 250 tons.

Official turnovers in l.tons for the week ending April 1, with the previous week's figures in parentheses, are:

| | | |
|---|---|---|
| Copper ... ... | 9,250 | (14,500) |
| Tin ... ... | 625 | (1,115) |
| Lead ... ... | 7,800 | (7,575) |
| Zinc ... ... | 6,950 | (7,600) |

Closing prices were as follows:

| | March 29 *Buyers* | March 29 *Sellers* | April 6 *Buyers* | April 6 *Sellers* |
|---|---|---|---|---|
| COPPER | | | | |
| Cash .. .. | £224 | £224½ | £226½ | £226¾ |
| Three months .. | £226¼ | £226½ | £228 | £228¼ |
| Settlement .. | £224½ | | £226¾ | |
| LEAD | | | | |
| Current ½ month | £65⅞ | £65¾ | £66⅛ | £66⅜ |
| Three months .. | £66⅛ | £66⅜ | £67⅛ | £67⅜ |
| TIN | | | | |
| Cash .. .. | £823 | £824 | £828 | £828½ |
| Three months .. | £827 | £827½ | £830½ | £831 |
| Settlement .. | £824 | | £828½ | |
| ZINC | | | | |
| Current ½ month | £83½ | £83¾ | £84¼ | £84½ |
| Three months .. | £83⅛ | £83¼ | £84 | £84¼ |


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## *Mining Finance*

# The Harmony—Virginia—Merries Deal

The full details have now been published of the scheme involving the three Orange Free State gold producers in the south-eastern corner of the field, Harmony in the Central Mining group and Virginia and Merriespruit both in the Anglo-Transvaal group (see *M.J.*, January 20, pp. 80). The deal is primarily designed to give the struggling Virginia property, which derives most of its earnings from uranium, a new lease of life. Harmony, the richest and most prosperous of the three, seems to come best out of the new arrangement. Merriespruit has, of course, been flooded since 1956.

The main feature of the new set-up is that Virginia is purchasing from Harmony two sections of the latter's property totalling approximately 397 claims for a sum of £3,000,000, payment to be spread over six years. The areas involved are estimated to contain about 5,000,000 tons of mineable ore and should enable Virginia to continue profitable operations until the end of 1966. In that year, on June 30, the company's uranium contract runs out. It is pretty broadly hinted in the official circular that any prospective life after 1966 depends on a higher price for gold having come about by then.

Virginia is also to work part of the Merriespruit property amounting to about 320 claims on a tribute basis, reimbursing the latter company for the development work done there (£334,537 up to the end of 1960) and paying Merriespruit half the profits made from the gold extracted. Unfortunately all this does not bring the long-suffering holders of Virginia within sight of a dividend. It is pointed out that in addition to the £3,000,000 to be paid to Harmony and the capital expenditure involved in exploiting the new areas, Virginia had loan liabilities as at March 1 of no less than £9,919,680 which must be paid off in full before any dividends can be distributed. In order to speed up their repayment the whole of the company's profits, instead of half as hitherto, is to be devoted to this purpose.

Even so, the present dividend prospects are described as "not encouraging". On the other hand, the circular goes on, "the extension of the life of Virginia's mine as now proposed prolongs the chances of the enhancement of Ordinary stockholders' prospects which could be brought about by an improvement in present conditions such as an increase in the price of gold". Virginia 5s. units are quoted at 3s. They rank as little more than a gold price gamble. Their asset backing at the moment is nil in view of the company's big burden of debt.

Merriespruit remains from any point of view a hopeless proposition. It is estimated that the tributing arrangement will bring in a net amount of £600,000 for gold and uranium between now and June, 1966. Against this there are loan liabilities of £8,448,848. So, as the circular rightly says, under present conditions it is "improbable" that the secured creditors can be paid in full and there is no prospect of any return of capital or any dividends for Ordinary stockholders. The 5s. units are 1s. 6d. and it is difficult to see that they are worth even this. Rand Mines, incidentally, is taking over technical control of the property from Anglo-Vaal.

### BRIGHTER PICTURE FOR HARMONY

With Harmony we come to a much brighter picture. This mine has been paying steadily increasing dividends since 1956. The latest half-yearly payment, declared last week, was 14 c. per 5s. share equal to 1s. 4.8d. sterling. It brings the total distribution for the year to June 30 next up to 2s. 9.3d. compared with 2s 6d. for 1959-60.

Harmony is one of those mines that has had its uranium contract stretched out until 1970, which means that its earnings from this source during the next five years will be little over half what they would have been under the old contract. As the company obtains around 40 per cent of its profits from uranium and on top of this will have to face tax liabilities eventually, possibly starting in 1963, it looks as though the period of normal dividend growth may be over despite the fact that gold-mining operations are still expanding.

Particularly welcome, therefore, is the present news that practically all the £3,000,000 to be received by the company free of tax for its property sale to Virginia is to be returned to shareholders up to a total of £2,970,000, or 3s. 3.6d. per 5s. share, by half-yearly tax free payments of 3.6d. a share along with the half-yearly dividends starting next September. It will mean that over the five year period of reduced uranium earnings there will be this useful adjunct to the normal taxed dividend. It is also interesting to note that if the gold price goes up above £12 12s. an oz. (it is currently £12 10s. 9d. in London) then the £3,000,000 purchase price is subject to a degree of upward revision.

It is, of course, to Harmony's advantage to keep the Virginia mine going as long as possible. If it closed then Harmony would face large capital expenditure and heavy additional pumping costs in order to keep its own mine dry. It would also have to bear a larger proportion of the expenses involved in running the Virginia township. Harmony is expanding its mill rate to 200,000 tons. It crushed a record 177,000 tons in January. This expansion will continue in the new conditions, but at a slower rate. Harmony at 25s. offers a yield of 11.1 per cent on the 1960-61 dividend and obviously has strong recovery possibilities in any better Kaffir market.

# London Market Highlights

After looking a rather more encouraging market immediately prior to Easter, South African gold shares took a new turn for the worse this week. There were no fresh adverse developments on the news front, but a steady increase in small local selling orders may well have been the result of tired Kaffir holders deciding at last that the buoyancy of the U.K. industrial market could be ignored no longer.

Whatever the reason, the fact remained that these local sales caused a heavy depression in an extremely thin and unreceptive sharemarket. Johannesburg was unable to stop the downdrift on Tuesday owing to communication difficulties and on Wednesday when the *F.T.* Gold Mines index fell to a new all-time low, the Cape was disinclined to do much in front of the Van Riebeeck holiday.

Widespread price losses ranged up to 3s. 9d. or so, "Ofsits" being this much down at 61s. 3d. in a weak O.F.S. group. Free State Geduld came back to 97s. 6d. and West Wits sank to only 53s. 9d. The rather complicated details of the scheme to prolong Virginia's life caused only further price losses. Merriespruit were halved in price to 10½d. at which level they still seemed to be vulnerable. Virginia remained at 3s., but Harmony came back 1s. 3d. to 24s. 3d. even though the arrangement with Virginia will mean that Harmony holders are to get a useful tax-free return of capital. De Beers dropped 2s. 6d. to 130s. despite the imminence of what were expected to be good March quarter sales figures.

Rhodesians, on the other hand, remained steady enough and occasionally improved a few pence. There was again a good deal of interest in Rhodesian Selection Trust, the shares of which hardened for a while to 11s. 7½d. before reacting to 11s. 3d. on the eve of Sir Ronald Prain's speech at the London informal meeting of the company. Selection Trust ran into some profit-taking but soon rallied to 86s. 3d. under the impact of the record profits earned last year by American Metal Climax. Inevitably, Chartered eased to 66s. 6d. in sympathy with their Kaffir interests.

Tins responded to the greatly improved Laos situation. Singapore again inquired for its usual favourites such as Ayer Hitam (35s.), and Siamese (15s.) while local attention centred on Southern Malayan (31s. 6d.) and British Tin (43s. 6d.).

A welcome feature elsewhere was the sudden return to life of Consolidated Murchison. The shares, which were once the darling of the more speculatively minded investor, spurted 6s. 10½d. to 47s. 6d. following a good revival in demand for antimony and an upward adjustment in the commodity price. Ashanti Goldfields rose to 15s. 3d. following the reassuring speech at the meeting, but the shares later wilted to 14s. when some profit-taking materialized.

### HIGHLIGHTS OF THE JOHNNIES GROUP ANNUALS

Highlights of the annual reports for the South African gold and uranium mines in the Johannesburg Consolidated group are that Randfontein hopes to make a net profit of around £1,000,000 this year from its revised uranium contract against a comparable £644,371 last year; the outlook for Freddie's Consolidated remains gloomy with the prospect of diminishing operations on the Basal reef this year and, in the "probable event" of the Elsburg reef drilling programme not being successful, the likelihood of a decision having to be made whether to abandon the mine and sell

the assets or whether it should be put on some form of care and maintenance basis; Western Areas, the developing mine south of Randfontein, is ahead of schedule and may now be brought to production during the first half of next year.

Western Areas had £1,164,182 in hand at the end of last year and has called up further capital amounting to £1,489,035 since then. There is still a further £200,542 to be called to bring the issued capital to a total of £8,270,000, estimated in the prospectus to be sufficient to reach production without a mill. The initial 50,000 tons of ore per month are to be treated at the neighbouring Randfontein property. The 10s. shares are 17s 3d. and would undoubtedly be attracting speculative interest at this stage were it not for the general Kaffir market malaise.

### PLATINUM DIVIDEND CUTS—AS EXPECTED

In his annual statement in January Mr. D. A. B. Watson, chairman of Rustenburg Platinum Mines, predicted that this big South African platinum producer might suffer a 25 per cent cut in net earnings in the current year to August 31 next, as a result of the improvement in sales during the early months of the period not having been maintained. There was thus no surprise last week when the company, as the accompanying table shows, cut its interim dividend by approximately 20 per cent. In consequence the three holding companies also reduced their interims as did Lydenburg Platinum which is indirectly interested in Rustenburg through a 26 per cent stake in Waterval. The figures are as follows:

| | 1959-60 | | 1960-61 |
|---|---|---|---|
| | Interim | Final | Interim |
| | s. d. | s. d. | s. d. |
| Rustenburg ... | 15 0 | 34 9 | 12 1.2 |
| Potgietersrust ... | 0 5 | 1 0 | 0 4.2 |
| Union Plat. ... | 0 8 | 1 7½ | 0 6.36 |
| Waterval ... | 0 8½ | 1 8½ | 0 6.96 |
| Lydenburg ... | 0 5¼ | 0 11¼ | 0 4.2 |

Rustenburg's capital of £868,600 in £1 shares is held as to 43.3 per cent by Potgietersrust Platinums, 39.2 per cent by Waterval (Rustenburg) Platinum Mining and 17.5 per cent by Union Platinum. In its latest dividend announcement Rustenburg says that market conditions in platinum have continued quiet since Mr. Watson's statement in January and the general outlook for the current year remains unaltered. The rate of production at the company's mines, which is still in excess of the estimated annual level of sales, will be reduced, as stocks rise to the desired levels. These levels are those designed to enable Rustenburg to deal quickly and efficiently with any sudden upturns in demand from consumers of the metal.

The company's output is dealt with in London by Johnson, Matthey & Co. and this concern together with Baker Platinum which handles North America's platinum production, has kept its price for the metal at £30 5s. an ounce ever since January of last year when it reached the peak of a fairly steep recovery in price stimulated by the increasing uses of platinum in modern industry and the fading out of Russian sales as a market factor. Rustenburg now says that free market prices, which can sometimes be a pointer to which way the two major refiners' quotation may move, have been steady at levels slightly lower than the official price.

It looks as though much now depends on the course of U.S. economic activity as to whether the £30 5s. level can be indefinitely maintained in the face of slack demand. The average for Rustenburg's year to August, 1960, was £29 11s. 4d. an ounce compared with £24 13s. 3d. in 1958-59. Meanwhile, the South African platinum shares show bumper yields of around 16 to 18 per cent on last year's payments, and are well discounting the current cuts. Present prices are Potgietersrust 7s. Union 10s. 6d., Waterval 11s. 6d. and Lydenburg 7s. 1½d. The last-named should not, incidentally, be confused with Lydenburg Estates, a London mining company.

### AMERICAN METAL'S RECORD YEAR

The course of the big U.S. company, American Metal Climax, is of particular importance to shareholders in Selection Trust which has a 12.4 per cent interest therein. A.M.C. had a record year in 1960 with earnings 26 per cent more than in 1959. This led to the quarterly dividend of 30 c. per share being raised to 35 c. for the final three months of the period and the first declaration for 1961 has confirmed this new rate. In other words, there is a minimum prospect of $1.40 a share being paid against last year's total of $1.25.

A high level of molybdenum sales was the prime factor in the company's 1960 results but there was also a 43 per cent increase in revenue from the important stake in Rhodesian copper mining through a 50.6 per cent holding of Rhodesian Selection Trust's equity capital and 32.65 per cent of Roan Antelope's. Total dividend from African sources equalled approximately 22 per cent of earnings.

The A.M.C. Board looks forward with quite a degree of confidence to its Rhodesian investments and its outline of the growth prospects for Rhodesian Selection Trust is the kind of thing that has no doubt stimulated the recent Wall Street buying spree in these particular shares.

A.M.C. looks well placed to participate in any recovery in the U.S. economy and, as the chairman, Mr. Hochschild, points out, working capital is now nearly $118,000,000 which "provides a base from which we can confidently broaden our activities and build further strength".

## Company News and Results

**Dividend Maintained by North Charterland.**—Having almost doubled in 1959, North Charterland profits in 1960 have only fallen a little short of this level and the directors have recommended that the dividend of 2d. per share be maintained. The fall in profits is mainly due to a drop in the prospecting revenue by £2,000. Anglo-Vaal Charterland Exploration Company has given notice of its intention to terminate the prospecting agreement, hence every endeavour is being made to negotiate a new agreement in order that the mineral value of the company's Concession Area can be established. Meeting Salisbury S.R. May 10, 1961.

**Burma Mines Maintain Dividend.**—Burma Mines Limited, the holding company for Burma Corp have announced that the profit, before taxation, for the year to December 31, 1960, is £79,256 compared with £88,461 for the previous year. The board have recommended that the dividend of 1¼d. be maintained. Meeting May 12, 1961.

**Trepca Mines.**—Since Trepca's Yugoslavian mining properties were nationalized in 1946 the distribution of the assets has been continually delayed. The final compensation payment was received in 1958 since when the legal proceedings concerning Mr. Pasic's longstanding claim have caused even further delays. However, leave has now been given by the Court to distribute the assets which amount to 6s. 4.3d. per 5s. unit. The register was closed on March 16, and on March 28 the circulars were sent to stockholders.

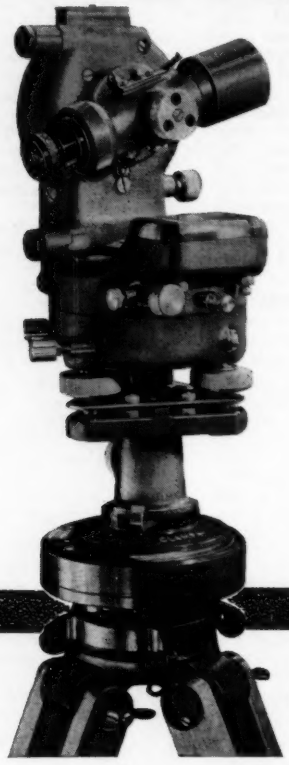
**British Tin's Portfolio.**—Speaking at last week's annual general meeting of British Tin Investment, the Chairman disclosed that although the market value of the corporation's investments had only increased by 3 per cent during 1960, a year of considerable decline in general equity prices, there had been a further increase since the beginning of 1961 from the latest balance sheet figure of £8,371,912 to over £10,500,000. He also made the point that the sales of South African and Rhodesian shares referred to in his statement circulated with the accounts had yielded a satisfactory profit.

**Halkyn's Results.**—In consequence of the special dividend distribution of a shilling per stock unit (see *M.J.*, January 6, p. 26), Halkyn District United Mines reports a small loss on the year to December 31 last of £1,523 leaving the carry forward at £6,540 (£33,258). It will be recalled that the special dividend distribution was made because the company's liquid resources were felt to be in excess of the needs of its limestone business and that there was no early prospect of its lead mines being able to reopen profitably.

**Anaconda's Earnings.**—The Anaconda Company's earnings (i.e. gross sales) during 1960 are reported at $624,421,651. Net earnings totalled $46,112,500 equivalent to $4.30 per share. Dividend payments during 1960 were $2.50 per share. Total copper production by the Anaconda organization reached an all time record at 597,674 s.tons in spite of strikes at three of the company's major operations which resulted in a loss of production of approximately 57,500 s.tons. The Anaconda company estimates world demand for copper during 1960 at 3,600,000 s.tons, a new peacetime record.

**Mary Kathleen.**—1960 profits are fractionally below those for 1959 and dividends for the year have totalled 4s. 6d. per share. The controlling company, Rio Tinto Mining Co. of Australia, is now a public company and a maiden dividend of 10 per cent for the current year has been forecast.

# Watts Mining Transit



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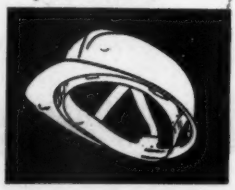

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# ASHANTI GOLDFIELDS CORPORATION

## NEW RECORDS ACHIEVED FOR FOURTH SUCCESSIVE TIME

## MAJ.-GENL. SIR EDWARD SPEARS' SPEECH

The 64th annual general meeting of Ashanti Goldfields Corporation Limited was held on March 29 at the Abercorn Rooms, Bishopsgate, London, E.C.2.

**Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D.** (Chairman and Managing Director) presided and, in the course of his speech, said :

Once more, for the fourth year in succession, a new record has been achieved in tonnage milled and gold produced.

Development added over half a million tons to the reserves.

When I was on the mine in February of this year a new all-time monthly record for gold output was achieved.

Under our planned programme of expansion the present capacity of the mill has now been reached and steps are being taken to increase it to an eventual 50,000 tons a month.

Ashanti is one of the great mines of the world. Technically, its position and prospects have never been better.

It is also, as I have said on previous occasions, one of the great national assets of Ghana.

As regards the political situation, I shall have something to say later about this and the crisis in the gold mining industry which developed while I was on the mine in January and February.

Since Ghana became a Republic in July, there have been some disquieting manifestations which have given a succession of shocks to the confidence of investors.

On the other hand, all President Nkrumah's plans for Ghana depend on the success of the Volta scheme and finance for the Five Year Development plan. In the circumstances, I believe that he will create a favourable climate for investment. In this connection he is fully aware of the important part the Corporation has to play, as is shown by the desire his Government has expressed to negotiate an extension of our Concession on terms not less favourable than those of our present lease. Nothing could do more to reassure investors than to make the Ashanti mine a show piece of successful partnership between overseas investment and the development of Ghana's natural resources, and I believe this is Dr. Nkrumah's sincere desire.

### The Accounts

Profit for the year was £1,738,957, after charging £347,591 to Ghana Government Duty but before Income Tax. We have provided £656,000 for Ghana Income Tax in these accounts and £34,262 for United Kingdom Tax on investment income.

The Interim Dividend of 1/- per share paid in September, 1960, and the proposed Final Dividend of 1/2d. per share, both less tax at 7/9d. in the £, take £828,470.

You will note that the total payable to the Ghana Government in Tax and Duty, £1,003,591, exceeds the amount paid in Dividends by £175,000.

In the current year, our programme is to treat 450,000 tons for a gold recovery of 360,000 ounces.

There is every indication that this will be achieved, and possibly bettered. Owing to rising costs, including wages, we expect the profits to be at about the same level as in the year under review.

Capital expenditure for the year is estimated at £498,000, £34,000 more than was spent in the year under review.

### Production

I referred earlier to the new records which have been achieved in the year under review.

436,781 tons milled yielding 357,335 ounces.

Working costs, including development, were £2,085,771.

The cost per ton milled rose to 95/6d., mainly due to the higher expenditure on development compared to the previous year.

The cost of producing an ounce of gold, excluding development, was 2/4d. less at 87/8d. per ounce, and mining profit per ton milled was 9d. higher at 109/9d.

### Ore Reserves

The ore reserves were recalculated at September 30, 1960, and are given in the Consulting Engineer's Report at 2,558,287 tons at an average grade of 16.89 dwts. per ton. This compares with 1,993,105 tons averaging 17.2 dwts. per ton in 1959. Tonnage is 565,182 tons higher than the previous year, but the grade is 0.35 dwts. per ton less. Of the total ore reserves 2,295,477 tons, at an average grade of 16.34 dwts. per ton, are immediately available, and 262,810 tons at an average grade of 21.72 dwts. per ton are contained in shaft and safety pillars.

### The Mines Abandonment Bill

Commenting on his visit to the Mine and the crisis which developed in regard to the Mines Abandonment Bill, the Chairman said :—

The crisis ended on February 14 with the issue of a communiqué by the Ghana Government and the Chamber of Mines.

This stated that the representatives of the Mining Companies would co-operate with the Government in providing for a smooth take over of the five mines which the Government was acquiring; and that it was the policy of the Government to co-operate to the fullest degree with Mining Companies in the private sector.

It reaffirmed that there was no intention of nationalizing or otherwise acquiring any other gold mines, and that on the contrary negotiations were continuing with Ashanti Goldfields Corporation upon a possible extension of their Concession.

Finally, it stated that as a result of discussions with the Chamber the Government had decided not to proceed with the Mines Abandonment Bill.

Nothing could have been more satisfactory. It was a complete victory for the responsible elements in Ghana over the extremists. When its full implications are realized over here it should do much to improve the climate for investment in Ghana.

Above all, for that is what principally concerns us here, it should reassure shareholders as to the intentions of the Ghana authorities towards the Corporation.

When the crisis began, I would not have dared to hope for such a favourable outcome.

President Nkrumah took the opportunity, in addressing a dinner given by the West Africa Committee during his recent visit to London, to reassert and emphasize that overseas investment was safe in Ghana.

This statement is very welcome, in the first place because of his evident desire to restore the confidence of investors, which had been sorely shaken.

It is also a reaffirmation to Ghana of his policy and of his intention to enforce it. For Directors of Companies with interests in Ghana it will be a reassurance that the President appreciates the fact that they have an overriding responsibility to their shareholders, that of safeguarding the monies entrusted to them.

The struggle between the extremists and the moderates in Ghana is still going on; but the former are weaker and we are certainly in a much more favourable position now than we were in the circumstances in which the Mines Abandonment Bill was introduced.

It was an unhappy episode, but it has ended well. The President, who today is all powerful, has backed with his immense authority the cause of sound business in the interest of Ghana's future.

The report and accounts were adopted.

# BIBIANI (1927) LIMITED

## SUCCESSFUL OUTCOME OF BOARD'S POLICY

The 34th annual general meeting of Bibiani (1927) Limited was held on March 29 in London.

**Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D.,** presided and, in the course of his speech, said : This is the last Annual General Meeting of the Company which I shall address you as Chairman and Managing Director.

You are aware of the offer that has been made to you by Messrs. Philip Hill, Higginson and Erlangers on behalf of the Government of Ghana to purchase your shares for 4/- a share, and that the Board has unanimously recommended that you should accept.

As you know, on January 17th last the Board announced, to their great regret, that Bibiani was being put on a reclamation basis, that production was being reduced immediately, and that milling was not expected to continue after October, 1962. This decision was forced on us because, in spite of an expenditure of over £746,000 in the last five years, no new orebody had been developed which would replace the tonnage mined from reserves.

I informed you last year that unless the development programme in 1959-60 produced favourable results, it was unlikely that we should be able to continue milling after October, 1962. In the event, not only were development results disappointing, but other factors affected ad-

versely our limited prospects of remaining in profitable operation; these included the boycott of South African imports into Ghana which meant that we had to order elsewhere and pay more for stores essential to the mine; and the imposition by the Ghana Government of wage increases and paid holidays. This so increased working costs that a very large tonnage of our dwindling ore reserves was rendered unpayable so that the programme of operations forecast in my speech last year could not be fulfilled.

Our decision to put the mine on a reclamation basis was taken for one overriding reason. We were determined not to dissipate the assets of the Company by operating at a loss, or to spend our remaining resources on exploratory development which was not certain to be remunerative.

We had approached the Government of Ghana with a request for a subsidy for development in May, 1960. We felt that they should be made fully aware of the facts and given the opportunity of contributing the necessary finance before a decision was taken to close the mine. On December 23 we were officially informed that the Government had decided to give no further assistance to mining companies.

I have said publicly, and I repeat, that I do not criticize this decision. It was for the Government to decide what was in their own best interests. As far as we are concerned, we were quite satisfied that, provided we carried through our policy of preserving to shareholders the full value of their capital, as we were determined to do, the Government's decision meant no loss to them. It was the employees of the mine, and the community built up around it, who would be affected; but we made our plans to minimize hardship as much as possible by allowing natural wastage to offset redundancies; and to offer employment to as many of the staff, both European and African, as could be taken on by our associated Company, Ashanti Gold Fields Corporation Ltd. This policy has been successfully carried out.

The report was adopted and the final dividend of 5% was approved.

## LONDON AND RHODESIAN MINING AND LAND COMPANY

### CHAIRMAN'S REVIEW

The annual general meeting of London and Rhodesian Mining and Land Company, Limited will be held on April 20 at Winchester House, Old Broad Street, London, E.C.2.

The following are extracts from the Statement by the Chairman, **Brigadier S. K. Thorburn, O.B.E., M.C.,** which has been circulated with the report and accounts :

The net profit of the Group for the year, after taxation, amounted to £65,139 as compared with £82,372 for the preceding fifteen months, and an interim dividend at the rate of 4 per cent was paid in November last. Your directors now propose the payment of a final dividend at the rate of 4 per cent and the two payments for the year totalling 8 per cent represent an increase of 2 per cent as compared with the annual rate for the previous accounting period.

The group's investments at the close of the Company's financial year had a market value of £995,000 as compared with a book value of £807,000 at the same date. It will readily be seen, therefore, that the Group's investments alone represent the equivalent of 5s. per share (or par) and, when considering the intrinsic value of your Company's shares, you must add to this figure the very considerable value of its ranches, town properties and mining interests, etc., all our liabilities being more than covered by our net current assets.

The African Investment Trust, Limited : This subsidiary made a profit of £79,421 after tax, as compared with a profit of some £73,000 for the preceding fifteen months. Despite some depreciation in recent months due to political reasons, on March 21, 1961, our portfolio of quoted investments still showed an overall appreciation of £115,000.

Mazoe Consolidated Mines Limited had another very satisfactory year and produced 12,467 fine ounces of gold for a working profit of £39,287.

Proved ore reserves at September 30, 1960, amounted to 100,740 tons averaging 6.4 dwts. In addition there are a further 21,860 tons which might justifiably be classified as probable reserves.

Commenting on the political situation in the Central African Federation, the chairman said : Unfortunately, there are many people in this country who know little or nothing of Africa and who seem intent for political or other reasons in lending their support to a vociferous minority of extremists, and also in promising these extremists things which they must know cannot be carried out for, at any rate, some years to come. I well believe, however, that commonsense will ultimately prevail.

The Current Year : With regard to the prospects for the current year, barring unforeseen setbacks, I am reasonably hopeful that we shall be able to give you another modest increase in your rate of dividend. Generally speaking, I look forward with some confidence to growing prosperity for your Company, but I must warn you that it will necessarily take time and one must therefore not expect spectacularly improved results within the immediate future.

**DAVIES INVESTMENTS LTD.,** Private Bankers (Gross assets exceed £2,500,000), are paying 7½% p.a. interest on deposits for the **eighth** year in succession, with extra ½% added annually on each £500 unit. Details and Audited Balance Sheet from Investment Dpt. MN., Davies Investments Ltd., Danes Inn House, 265 Strand, London, W.C.2.

# Company News

**Retirement of Mr. J. Ivan Spens.**—The retirement of Mr. J. Ivan Spens from the chairmanship of the London Tin Corporation was foreshadowed in an announcement last year. This has now taken effect from the end of March. Mr. Spens had been chairman since 1940. Sir Douglas Waring now succeeds him as chairman.

**Powell Duffryn Acquires Andrew Air Conditioning.**—Powell Duffryn Ltd., have acquired the whole of the issued share capital of Andrew Air Conditioning Ltd. of Stockport. The Andrew Co. occupies a leading position in air conditioning and dust control and in the manufacture of fans. Mr. W. H. Sharland has been appointed Chairman.

Carbon Products and Crusilite Departments became subsidiary companies of The Morgan Crucible Group with effect from April 1.

John Tinsley, a subsidiary of the Norcros Group, reports that they have recently been awarded contracts in India, Korea and Costa Rica for £230,000 of mining equipment.

The articles on " Recent Advances in Aerial Topographic Surveying for Mining ", in our issues of March 24 and 31, were written by Mr. Roy Hall, and not Mr. J. R. Hall, as published.

# Obituary

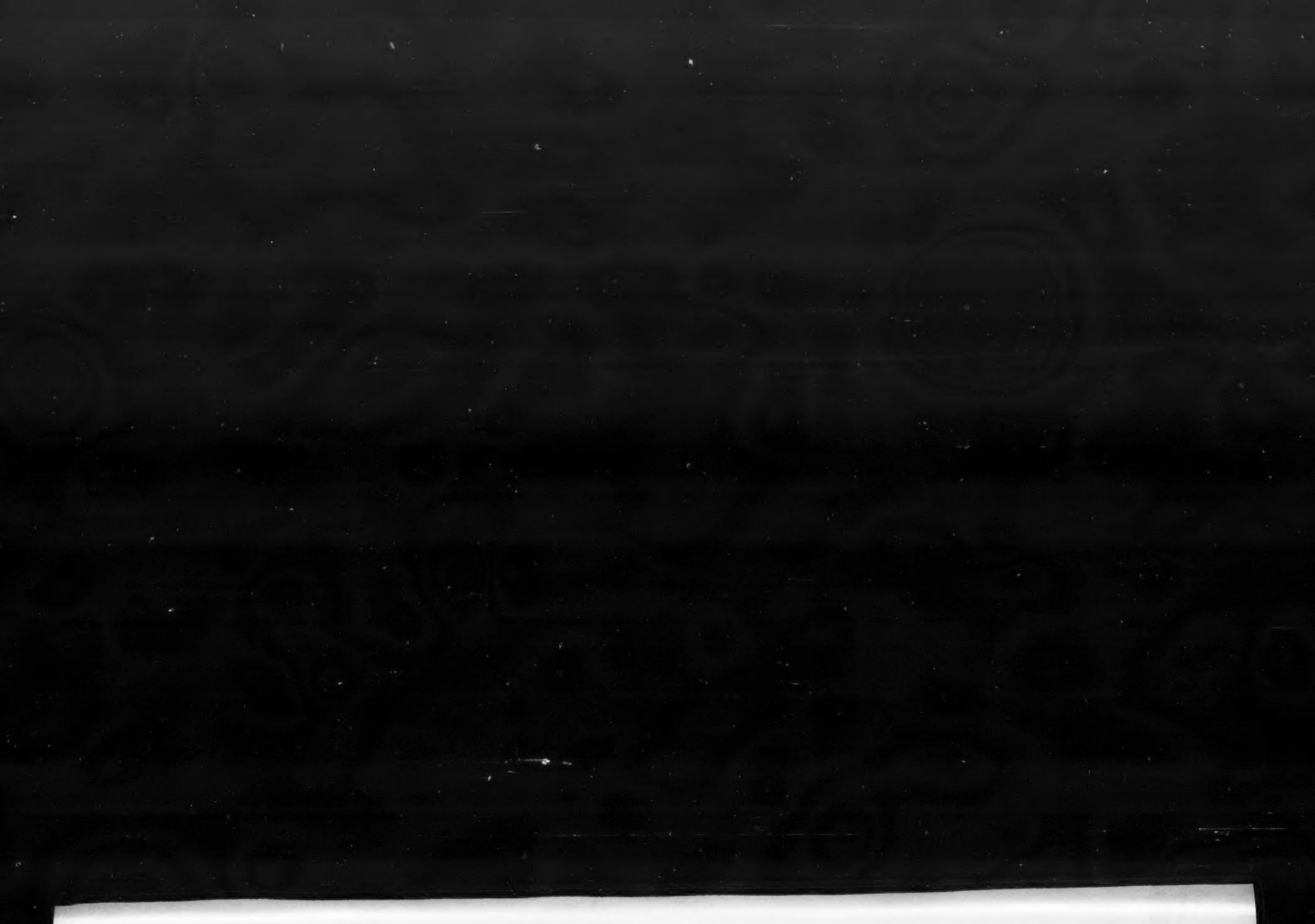
### MR. MICHAEL FALCON

We regret to announce the death of Mr. Michael Falcon, in South Africa on March 25 last, at the age of 58.

Born in Pretoria in 1903, Mr. Falcon was educated at Hilton College, and St. John's College, Cambridge, where he obtained his M.A. He subsequently continued his studies in the mining field, and became an Associate of the Royal School of Mines.

Returning to South Africa, Mr. Falcon joined Van Ryn Deep, at Benoni, Transvaal, working with them from 1927 to 1938 as surveyor, shift boss and eventually as mine overseer. During the second world war, he did part-time service with the Mines Engineering Brigade, S. African Engineering Corps, holding the rank of major.

In 1938, Mr. Falcon became Assistant Technical Adviser to the Transvaal and O.F.S. Chamber of Mines, and became Technical Adviser in 1951. He was elected president of the Chemical, Metallurgical and Mining Society (S. Africa) (now the S.A. Institute of Mining and Metallurgy) during 1946-47.

Mr. Falcon was chairman of the South African Executive Committee of the Seventh Commonwealth Congress, convened by the S.A. Institute of Mining and Metallurgy which is opening in South Africa on April 10 next. When it was found that India would not be able to undertake the Congress this year, it was mainly due to Mr. Falcon's efforts that the Congress was brought to South Africa, and he has worked untiringly for its success.

Mr. Falcon is survived by his widow and two children.